

2100 NEEDED INVENTIONS



A source book of practical, money-making ideas that are crying aloud to be invented. With special chapters on Uncle Sam's call for wartime inventors • the art of inventing • how to develop and protect ideas • the work of the National Inventors Council, created by the Government for the aid and encouragement of inventors

By RAYMOND F. YATES

2100

Needed Inventions

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TO

BERT H. WHITE

banker, friend of inventors and genius of the
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prominently in making America a
better, richer country.

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Foreword

PRACTICALLY EVERY MACHINE and device that we have in the world today will eventually have to be invented all over again. That may sound a bit pessimistic to those who are convinced that we live and move in a wonderful age. It is an age of wonders, perhaps, but it is very far from an age of efficiency.

With scarcely an exception, all of the machines we use are crude and inefficient and only partially developed. Our locomotives use but 8% of the energy in the coal fed to them, and our automobile engines convert but 18% of the power in gasoline. Electric motors, washing machines, refrigerators, and even common household scissors, are used every day and yet they remain but crude representations of the things they really *ought* to be. We need better, simpler and less wasteful articles—less wasteful not only of energy, but of human time and human labor.

These facts are brought to the mind of the reader and the prospective inventor in order that he may better understand the needs outlined in the following pages. Otherwise, in reading the remainder of this book he is likely to say, "Why, that thing has already been invented." That may be true, but if the thing in question is mentioned in the pages that follow, the reader may take it for granted that the article or device as it exists at present is far from the ultimate solution. It needs refining; it needs the attention of an inventor who can either make it in a better, simpler way, or who can convert it into the really useful and efficient thing it should be. There are very few basic patents issued in the course of a year, but there are thousands of improvement patents which reward their owners handsomely.

The inventor setting out to solve a problem should not allow his mind to be shackled by tradition or conventional manufacturing methods. He should make every effort to develop an entirely *new* article, new in principle, new in results achieved. The man who first perfected the carpet sweeper did not try to produce a gadget which would duplicate the motion of the human arms in brushing a broom over the floor. He thought of a new principle, the principle of rotating brushes that would automatically force the dirt up into a small compartment.

The man who set out to improve on the carpet sweeper, in turn, perfected an altogether new system that was far more scientific and efficient. He produced the vacuum cleaner and set air to work doing the things that had theretofore been done by brushes and brooms. These facts illuminate the writer's meaning when he maintains that many things will have to be invented all over again.

Practically every week there are announcements of new scientific discoveries which cry aloud for practical application by inventors. There will yet be a dozen as yet undreamed-of ways to use the photographic reproduction of sound. The new magnetic alloys will bring greater use of electromagnetic control, and we have still to discover many new uses for high frequency electric current. The real new world of science is, after all, many, many years off.

The field for invention is far greater today than it was fifty years ago because we not only have newer and better tools and materials to work with, but we also have a public that is quick to see, to understand and to buy the better thing. The world, and especially this country, has become science-minded.

Yet the person who thinks we live in a truly scientific world is to be pitied. There is a real, almost desperate need for inventors with analytical minds able to improve the ordinary equipment we come in contact with in our everyday lives. commonplace, imperfect devices may endure for years simply because no observing person has ever analyzed their imperfections and set out to improve them.

Invention is really a systematic form of criticism. Many things are improved simply because some critical soul has tarried to pick them to pieces. Few inventions are perfected through sudden inspiration. The real inventor searches out a problem and then hammers away at it week in and week out until he arrives at what he thinks to be a fair solution. It is then that he retires to his shop to reduce his idea to actual practice.

The recognition of a problem is not the easiest thing in the world. Many men can solve problems but precious few can discover them, and that is the fundamental purpose of this book—to suggest *where to start*. The mere reading of a few pages of needed inventions will immediately stimulate the creative mind to other ideas which were never discovered by the writer in his researches. It is the writer's opinion that many men would be able to perfect articles if they could be sure they were tackling an idea which would make them some money once they perfected it. A sound commercial sense as it relates to inventions is a rare gift indeed and if the average man had it we should be living in a scientific Utopia today.

In developing an invention, the item of manufacturing cost must always be borne in mind. Gingerbread frills should be rigidly eliminated and the problem stripped to its bare essentials. Let us suppose that you have invented a can opener. It does the work just as well, but not better, than an opener which sells for one dollar. But your design is so ingeniously simplified that you can sell it for fifty cents with a good profit margin. Assuming that good commercial judgment is displayed, no power on earth can keep your can opener from sweeping the higher-priced one from the market. All inventions are subject to this fundamental price competition; therein lies the hope of the inventor, for there isn't an invention in the world too successful for him to shoot at with improvements—and therein lies a danger, too, for some one may come out next year with an improvement on your own invention which does the work at half the cost. But the true creative mind welcomes this type of competition to keep mentally on one's toes.

Having thus explained the object of this book, the writer turns it over to the genius of the world with the hope that it will provide food for thought and the opportunity for inventors to make a great deal of money. Depression, wars nor anything else can destroy the market for worth-while ideas—practical, simple inventions are more in demand today than at any period in history, simply because the rate of human progress is constantly accelerated.

Although the needed inventions listed in this book have been divided for convenience into various chapters such as electrical, radio, chemical, etc., it will be found that many of them overlap into broader fields. An electrical problem can also be a radio invention, a chemical idea can be of general importance, and so on. The numbering of the listed inventions is purely a reference aid.

Every man who reads this book will no doubt find at least one problem to which he will be attracted and with which he will have an even chance to succeed, provided, of course, that he does not wait for a "happy inspiration" and that he applies himself as energetically as possible.

Answers to problems rarely come out of the blue. They have to be worked with, fought with and slept with before the light begins to dawn. A hundred possible answers may suggest themselves only to be rejected before the final answer, the *right* answer, is arrived at. We often see clever and simple devices for sale at the counters of chain stores which cause us to chastise ourselves mentally with some such remark as, "Why, I could have thought of that years ago and made a lot of money with it!"

Certainly you *could* have—practically any intelligent person has it in him to become an inventor—but you didn't. Some one else was more energetic, worked it out, protected the article and put it on the market.

So goes the story of each successful invention, be it large or be it small, and it will always be so. The man who makes money with an invention is the man who first *sees* and then *does*.

Fortunes for Inventors

EACH YEAR checks to the tune of \$280,000,000 are made out to American inventors and gadgeteers, many of them common people even as you and I who, either by design or inspiration, have managed to fill some little want. Tickets to the "inventors' sweepstakes" are free and everyone has a chance to win the big money. The maws of America's hungry machines, in war or out, must be fed with new gadgets. Inventors, casual, embryonic, and professional, wax rich supplying the public with little things that it needs or thinks it needs. Here is a contest with fabulous rewards that never ends.

A man stood waiting for a streetcar in Washington, D. C. He picked up a hairpin from the sidewalk, idly bent it around his fingers. It suddenly occurred to him that this piece of wire, properly bent, could be used to hold papers together. That marked the birth of the paper clip and a large fortune. That chap had never invented anything before in his life; like thousands of others, he was a one-shot inventor who struck it rich.

That happened years ago; but not so with Mrs. Anna J. Greenwich of Chicago, who had a jobless husband, four kids and a place on relief. She invented a clever new hair curler, sold it for a handsome figure, paid back her relief money, and saved the family homestead.

And there is the remarkable case of Grandma Birdora White, also of Chicago. Grandma White, aged seventy, was no female Edison, but she rang the bell with a new and better overall buckle. Then the Santa Claus who sits year round in the Patent Office left \$350,000 in her stocking.

A volume could be filled with just such stories about com-

mon people who joined the gadgeteers and rode a gimmick to fortune. America spends \$1,500,000,000 annually on articles selling for between a nickel and fifty cents.

A man once bored a quarter-inch hole in a pipe on a glass-blowing machine, and made \$100,000. Clarence W. White, the inventor of the Kiddie Kar, rolled up a cool million on public endorsement of his simple idea.

Chief among the shortcomings of the average inventor is that he produces things for which only a purely imaginary need exists. So now for a little discussion of some actual needs on which you can try plain common sense. Get your thinking cap on. Ideas today, royalty checks tomorrow!

Yes, they are still paying off on new ideas and they always will but it is this that has made America great and will continue to make it great. We are the "inventingest" nation in the world. Indeed, we lead the way. We are "invention conscious" and our manufacturers will take longer chances and pay more for a new gimmick than other manufacturers any place in the world. We like our inventions hot off the griddle and a new idea of merit does not have to hang around long looking for a buyer. Buyers really do more looking for inventors than do inventors for buyers.

It's strange how many men—and women, too, for that matter—have what we might call the inventor's inferiority complex. They are awed by patents and the Patent Office, feeling that they are trespassing somehow or other upon the special preserve of genius. For this reason, thousands of good ideas every year die aborning and millions of dollars that might be passed out in royalties moulder in our banks. What a pity! Just a little confidence, just a little push and initiative might often bring a fortune, even fame and the undying gratitude of a nation or the world at large. How lucky America has been that men like Westinghouse, Whitney, Edison, Howe, Shoales, McCormick and thousands of John Does, all with common school education, had enough of the pioneering spirit and perseverance to pass on to our great land its heritage of genius.

If you have a good idea, manufacturers do not ask you who you are, where you were born or where you were educated. They simply ask you what you want for it. They are looking for grist for the sixty-billion-dollar industrial plant that we must keep going or bust. And when we say bust, we mean it. This land of ours, like no other land in the whole world, lives on new things. Its inventors, anonymous or otherwise, are its most important contributors to the good life and the democratic way leading to prosperity and plenty for all.

The Vast Field of Invention

THOMAS A. EDISON, grand old man of American invention, once said that inventors as a class were the poorest paid men in the world considering their contributions to civilization. That is very true, but it does not mean that we do not have some mighty clever inventors who see to it that they make money with their ideas. Every year in this country hundreds of millions of dollars are paid out to inventors as royalty or for the outright sale of ideas.

There is very little that separates the clever money-making inventors from the fellows who never appear to make anything with their brilliant minds. Fundamentally they are all the same class of men. There is only one *important* difference. The fellows who succeed are the men who work on the right kind of problems, the kind of things that manufacturers and the public want; labor savers, money savers and those thousand-and-one little conveniences of daily life that make the world a bigger, better and happier place to live in.

These are the fortune-making schemes that cause the wheels of industry to turn. Our lives spin around invention and research. Anticipating a real need is just as important as inventing. An inventor may have what he thinks is a real need and spend half his life in evolving a clever machine to fill that need. In the end he may find that he has been chasing a rainbow. He simply lacks good commercial sense. He could just as well have spent his time inventing some sort of a little pressed metal gadget for the kitchen that could have been sold in the chain stores. It would have made him wealthy in a few years' time and he would have had none of the great and very real grief that goes with the perfection of something that is not needed.

Let us cite a case in point. A few years ago an inventor patented a device that caused an electric motor to rock a chair. Now imagine, if you will, the sad spectacle of anybody too lazy to rock his own chair! No wonder he could not make money with his idea. Then there is the case of the fellow who invented a counting device to attach to hens so that the eggs they laid would be numbered!

This almost sounds like a good joke, but it was far from a joke to the man who paid out his good money for a patent and who worried o' nights about his scheme. The bitter disappointment, the shock that he received, was none the less real and stinging. If he had expended the same effort on something that was actually needed he might be wealthy today instead of being a sadder but wiser man. And so the story goes. One cannot pick up a single issue of the Patent Office Gazette without seeing dozens of patents that never should have been issued. They represent real sweat and blood, and all uselessly.

Inventors need only use their God-given eyes. Some one has said that the greatest room in the world is the room for improvement, and nothing was ever more true, more to the point. When all is said and done, nothing is perfect. Half of the things that we have today will have to be invented over again.

When Latimer Scholes "perfected" his first typewriter, it was thought to be quite a marvel. A writing machine! Imagine! Today Latimer Scholes' first model is just a hopeless piece of junk that would draw a laugh from any man who has seen the modern machine; machines that have standing back of their perfection thousands of patents. And we may safely make the statement that the typewriters that we are using today and which we think to represent the real acme of perfection will some day appear just as crude, just as hopeless as Scholes' first machine. Invention never stops. It can't stop so long as we have men of genius.

It has been said to inventors, "Get the idea and the invention will take care of itself." There is always one best way of doing a thing, according to present standards of mechanics and sci-

ence. Any clever man can find that one best way if he tries. He simply wants to be assured that he is not barking up the wrong tree and that he will have something the world needs when he finishes. If he does, wealth will hound him, it will hunt him down regardless of how urgently he chases it. That is the easy part of it. The rest will almost take care of itself. There is no great secret to successful inventing. It is just like any other profession.

Every one of us rubs elbows every day with a hundred different things that either need to be invented or else perfected to a higher and more efficient degree: Take a lawn mower, for instance. Why not a machine that will sharpen itself, one that will remain in perfect adjustment once it has been set and one that will not pick up bits of wood and stone to clog itself?

Would that be an invention? It certainly would be, and it would be worth a million dollars. It does not take any special training or any special genius to find these things out. Any man may develop a critical attitude and upon looking at or using a device ask himself the simple questions, "How can this thing be improved?" "How can it be made more cheaply with fewer parts?" etc. It comes natural to every man to be more or less critical. It is born in the race and any psychologist will tell you that it is this critical attitude that is responsible for inventions.

Even as a man walks down the street he can see things that need to be improved upon. Electric signs, automobiles, trolley cars, baby carriages and a dozen other things meet his every glance. All he needs to do is to develop a habit of tearing these things apart and rebuilding them in his own mind. Every man is an inventor. We just can't help inventing. Every time we say something we have to invent a phrase of words to say it with. We are innately creative.

Another trouble with inventors is that they are too inclined to think that merely because a new idea is theirs, it must be good. They don't stop to think "commercial sense." They immediately start building up air castles and take their feet off

the ground. They should be just as heartless, just as savage and relentless in gauging their own ideas as the manufacturers who will be called upon to buy them later.

As a matter of fact, the first thing that an inventor should do when he has a new idea is to argue with himself *why the thing should not be developed*. By taking this purely negative viewpoint, he will be able to iron "bugs" out of it that he would not otherwise see. It is the easiest thing in the world to prove to ourselves that pleasant things are much more true than they are apt to be. This is terribly true of inventors as a class, and more fail for this reason than for any other.

What the author has tried to do in this book is to supply inventors with real food for thought. In some cases they may find ideas and problems which they will feel sure have been patented before. However, it should be borne in mind that previous patents may have been useless and that the problem still remains waiting for a more clever solution. These problems have been chosen with a great deal of care by men who know their business as inventors, and the lucky fellow who can supply some of the solutions—or even one of the solutions—will find himself in the possession of something that will bring him wealth and social prestige.

During the early 80's, Paris had an industrial exhibition and our own Thomas A. Edison, then one of the most brilliant experimentalists that the world had ever seen, displayed what had become known at his Menlo Park laboratory as the "little black box."

This was a box of mystery and although it had only a small loop of wire inside it, with the ends of the wire forming a small gap, there was not a scientist in the whole world who could explain why a tiny spark jumped across this gap when a spark coil was operated in the vicinity. It was a strange and mysterious performance and not one of the men in the laboratory, including Edison himself, looked upon it as anything more important than a mere scientific oddity. It had no prac-

tical features and was therefore not worth the attention of the workers.

During the exhibit, some of the greatest scientists of Europe peeked into that little black box and passed on, wondering what caused that tiny spark. And then a young man twenty-seven years old and a graduate of the University of Bonn, peeked into the box and a billion dollar industry came as a result of what he saw, for that young man was Heinrich Hertz, the real father of radio. The brilliant mind of Hertz not only gave us radio but photo-electric cells and the industrial control of heavy machinery by means of light beams, for it was this young prince of experimenters who first showed that charged plates could be discharged by the action of light.

We might go on and mention hundreds of cases where slight effects noticed in the laboratory have developed into revolutionary industrial and scientific discoveries. M. Henri Becquerel dropped a piece of pitchblende on a photographic plate and the world was not only shocked with the discovery of radio-activity, but with the new electric theory of matter also.

A quivering muscle in a frog's leg brought about the first chemical generators of electricity, and the discharge of electricity through gases, a curious laboratory stunt to the celebrated Geissler during the early part of the nineteenth century, became eventually the neon sign of today. And it was Dr. Kerr who in 1877 was observing enough to notice that a ray of polarized light is rotated when reflected from the surface of a magnet. That tiny effect is today, after the passing of fifty-five years, important to television experimentalists and ready for scores of applications as yet unthought of.

We still have plenty of these odd effects waiting to find a use in the world of commerce and many of them are crying out for the want of that touch of genius that has so often transformed insignificant happenings into million-dollar inventions.

If an inventor could apply the effect discovered by Peltier in 1834, he could evolve an electric refrigerator that would not have one moving part, no gas, no compressors or electric mo-

tors. Not only that, but such a refrigerator would cost one-third of present ice boxes and operate at three times the efficiency.

It was Peltier who found that a junction formed by two dissimilar metals was cooled when a current was permitted to pass in the *right* direction. Is this not the ideal method of electric refrigeration? It is waiting for some clever inventor to haul it out of the laboratory and set it up in the great American home. There is a million dollars in it for the man who can turn the trick.

We still go on burning our electric lights that convert only 7% of the energy fed to them into light that we can use. The rest of the energy is dissipated in the form of useless heat. Indeed, we should not call them electric lights, we should call them "electric heats." Civilization is badly in need of low temperature lighting and if some ingenious inventor will investigate the principle of lighting about to be described, we shall some day have lighting without high temperature filaments.

There is an odd light that has been the object of many so-called scientific investigations, but as yet no practical-minded inventor has tried his luck with it. It is formed by placing two electrodes in an electrolyte of aluminum citrate and the one electrode is either of carbon or lead while the other is of aluminum.

If the aluminum electrode is connected to the positive terminal of a variable direct current supply, a bright glow and finally a brilliant series of sparkling spots will be developed on the surface of the electrode as the voltage is raised by means of a potentiometer. Physicists know this to be a most efficient source of illumination, but we still have to make it commercially available.

When paper is soaked in a solution of potassium bichromate and laid away to dry, it will be found, after it has dried, that it is sensitive to light. Here is a cheap and plentiful photographic substance and we immediately think of the possibilities of printing our newspapers and magazines with such

material. If some inventor could find a way of doing this, millions would be cut from the national printing bill and printing operations would be speeded up two-fold.

Twenty years ago, photo-electric cells were still the subject of laboratory investigation and but a few men were aware of their industrial importance. Since that time hundreds of industrial uses have been found for a device that was once the mere pet of the purely academic type of research worker. Hundreds of industrial applications are yet to be made, for this innocent little glass bulb has possibilities as yet utterly undreamed of and hardly a day goes by that does not bring forth some new use. Of all the scientific principles that await application today none holds out more promise than this marvelous device.

Some of the early experimenters with electric current of the high-frequency kind, found that such currents had powerful heating effects when metal objects were brought near coils through which they passed. Dr. Northrup took advantage of this fact in producing high temperature electric furnaces in which metals could be melted in a vacuum, thereby producing them in a high state of purity. This was a most beautiful application of a principle that had long been known but which had simply been regarded as a curious fact far removed from the realm of practice.

It has often occurred to the writer that we have not as yet seen the end to the application of high-frequency heating. It is most ideal, for all of the heat is concentrated in the article to be heated. Why not a kitchen stove working on this principle? It would be most easy to arrange a piece of metal that would heat in this manner. Indeed, the very pot in which the food is contained could be used as the heating unit. Here indeed is a most promising field for the inventor who likes to play with electricity.

If the would-be inventor will examine any of the standard textbooks on electricity he will find described therein what is known as the Hughes induction balance, which is a simple machine (any good mechanic could build one in a few hours)

by means of which it is possible to measure extremely small magnetic effects. Here would be an ideal solution for a number of problems, for this machine is so sensitive that it will measure the difference in the magnetic susceptibility of all of the metals, even though some of them are only slightly magnetic. As a suggestion, one might mention the possibility of constructing a device that could be used in coin-operated machines to return slugs and thereby foil those who practice this brand of sneak thievery.

Any good book on physics will fill the inventor full of ideas coming from scientific principles that at present are nothing more than facts with a purely academic interest.

When you have decided what you want to invent, just how do you go about inventing it? First you must train your imagination to become inventive. That is by no means so difficult as it may sound. In the first place, you have plenty of creative imagination, or you would not be reading this book. But maybe your imagination, which is to say your inventive ability, needs exercise, like a muscle, to grow and become strong. Here are four ways in which you can make your inventiveness hit on all eight cylinders:

(1.) *Ask questions.*

Let's say you have an idea that a new type of lawnmower is needed. That's your problem. You can dream idly of some vaguely imagined mower that will make you a million dollars. That won't get you anywhere. It is surprising how many people conceive some fuzzy idea about a needed article and do nothing further about it. These very people are cruelly hurt when somebody else brings out their "very own invention." They may even threaten to sue, naturally to no avail. They forget that an invention is much more than a mere idea—it is the developing and perfecting of an idea so that it *works*.

The technique of *asking yourself questions* about your idea will start your mind working along practical channels. Write down every question you can possibly ask yourself about your

lawnmower. Should the blades have scalloped edges? Should there be a midget cowcatcher to push rocks and twigs out of the way? Should the gear ratios be higher or lower than the ordinary mower for more efficient cutting speeds?

You will wind up with a hundred, two hundred, maybe five hundred questions about your prospective invention. Some of the questions may sound silly, others will strike a spark to fire your imagination, and off you go along the trail seeking a solution. Now, for the first time, your idea about a needed lawnmower has started to become an invention. You are no longer dreaming about it vaguely, but thinking about it specifically, getting practical answers to your problems. No matter if trial and error produces many failures. Men like Edison left great notebooks crammed with questions raised by experiments that turned out badly—questions that, followed through, led to later success.

(2.) *Improve on a good model.*

Your camera, we will assume, is a mighty good one. The best engineering brains of a leading manufacturer produced it. But is it perfect? Not in this human world! You are not in any way brash because you love cameras and believe you can invent a better one.

A splendid way to get going on inventing an improved camera is to rebuild the good model you already have. That is, take it apart, study it piece by piece, imagining how you could make each part better. Here is an iris shutter, built expensively like a watch. The best iris shutter in the world admits maximum light only when it is fully opened—while the iris blades open and close, considerable light is shut out. If you can rebuild the model to use a different type of shutter, more efficient and cheaper, you have a great invention. Or if you merely figure out a way to improve the present type of shutter, you have a vital invention too.

So it goes with the kitchen toaster, your automobile, a bicycle, a coffee percolator—the machine that is ultimately perfect

hasn't been built yet. Try to make it better, piece by piece, and you'll find your brain clicking at a high level of inventiveness before you know it.

(3.) *Start over again.*

Suppose you manufacture toy automobiles driven by springs. Something happens to the market; you can't make toy cars any more. So you hook your spring motor to an advertising display card, so that it rolls the paper eyes of a pretty girl, and you're in the business of manufacturing display signs guaranteed to make window shoppers stop and take notice.

That's invention—a new and novel application. Thousands of things are just sitting around waiting to be put to work in new ways. Develop a critical attitude; keep asking yourself, "What would happen if the works of this clock had to be used in a new business?" and the like. Thus you strip away the blind acceptance of things as they are and clear your mental decks for action. Hundreds of automobiles were built with dashboards and whip sockets, years ago, because body designers were too fettered by ideas that had become ingrown from years of making buggies.

(4.) *Blend your ideas.*

A handsome hero in a novelist's mind is nothing more than a handsome hero. No story, no action. But let there be a beautiful heroine, and let her meet the hero—instantly the novelist conceives of a dozen bits of action and reaction between the two; now he can *create* his novel.

It's that way with ideas. Each of two ideas may be inert and useless in itself. But marry them, and you may produce a hybrid more brilliant than either the mother or father. Marry a set of knobs to a smooth-surfaced automobile tire. Somebody did that years ago and produced the first non-skid tire. Marry perfume and printing ink, and you have a product that turns out a scented newspaper advertisement that brings extra money from cosmetic manufacturers. Marry menthol to tobacco and you

have a mentholated cigarette that wins extra sales from smokers with colds in the head. The possibilities of blending ideas are endless. There's entirely too much single-blessedness among ideas for any inventive mind not to be struck by innumerable potentialities if he but looks about him.

Protecting and Selling Inventions

THE PATENT LAW of the United States is perhaps the most poorly understood law in the world, and the tragedy of this lies in the fact that it is poorly understood by those who should know it best—inventors. This is especially unfortunate inasmuch as the first step in successful inventing is a knowledge of the legal aspects of protection.

If an inventor, no matter how great his contribution to art or science, does not understand the limitations, extent and advantages of the Patent Law he will not realize the most from the product of his fertile brain. Indeed, he may lose all rights to his work and find that what is justly his belongs to somebody else through legal trickery and dishonesty.

This is not meant to discourage men with ideas. Rather it is intended to set them on their guard so that they may exercise their rights and use the simple methods that are available for protection at very little cost. A little knowledge of the matter will easily demonstrate the fact that each man's common law rights can be so established as to gain the respect and observance of the whole commonwealth. An ounce of prevention is worth a pound of lawsuit.

It is more or less the common opinion that once an inventor covers his work with a patent that he is secure and that he has but to cry out when his patent is infringed to bring the wrath and action of the great United States Government down upon the infringer. Nothing is farther from the truth.

Once a patent is granted, the United States Government washes its hands of the entire matter and leaves the poor inventor to shift for himself. It does not even guarantee the validity of the patent, much less protect the inventor. Boiled

down, the United States Government merely grants to the inventor the right to exploit his invention for a period of seventeen years. Aside from this it permits him to sue infringers for damages, but the costs of such infringement suits must be borne by the owner of the invention.

If the inventor does go to court and wins his case, he is placed in a powerful position for he can then have an injunction issued and stop the infringer from further damage and also collect royalties. His patent is then said to have been adjudicated—tested by law. His troubles may or may not end at this point, however, for if the infringer is big and powerful he may decide to carry the matter to a higher court in an effort to prove that even though the inventor has a patent the patent is not valid and the invention covered by it is not new.

If the inventor is in a financial position to carry on the fight he may win in the end, following his case all the way up to the Supreme Court of the United States. If he fails to obtain a favorable decision in the first court, the infringer may continue to manufacture the device until the final decision is rendered and this may take five years or more. Such are the rights of inventors.

This may sound very discouraging to the man with an idea that is new and useful, but it should be kept in mind that an extreme case has been cited. The truth of the matter is that we still have thousands of inventors who have made many millions of dollars with their ideas and that the annual royalty bill of the United States represents a staggering sum. Invention today is a more robust industry than it has ever been before in the history of mankind and the inventor who can produce new and better ideas is truly the man of the hour.

Technological development has reached a point where a vicious circle has been produced; civilization as we know it today cannot exist without new ideas, new inventions. It would "starve" in a few years and we would be thrown back

a thousand years in our progress if our great factories could not find and make new things with which to stimulate new buying and trade. Some great and unknown law is at work and this law holds that civilization cannot stand still without perishing; eternal progress or death! Such is the code of life, such is the true mission of the inventor. No other class of men has such a staggering responsibility.

There is great hope for the man who can invent, and it is pleasant to keep in mind the fact that the percentage of real inventors who make money with their ideas is large when compared with those who fail. It might well be said that the men who fail, fail because of some small obstacle which they were able to overcome but which, for some reason or other, they did not overcome; this providing that their ideas were new and good and that they did something better than it had ever been done before.

The speed with which manufacturers jump into new lines and market new conveniences and machines is amazing. It has been responsible for the development of an entirely new set of conditions that provides opportunities for inventors never before dreamed of. In the old days and at the dawn of the industrial age, inventors had to "sell" their ideas to a civilization that was half asleep, that was not conscious enough of its own vital needs to be able to recognize an improvement or a new necessity when it saw one.

The fight of Bell to introduce his telephone is a case in point. The man was laughed at as a fool. Abuse was heaped on him, and he even failed to sell his neighbor a half interest in his idea for the small sum of \$1200. Inventors no longer have to sell good ideas; they sell themselves. Today the man in the street is just as quick to buy and use something new as the manufacturer is to make it. We are at last an "invention-conscious" race.

In the Constitution of the United States of America there

will be found a passage that runs "to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." Such was the beginning of the United States Patent Law. It was the United States Congress of 1790 that enacted the first patent statute, the terms remaining practically unchanged until the year 1870 when some improvements were suggested.

The Patent Law of the United States states that new ideas for inventions must be turned over to a Commissioner of Patents to determine whether or not a new contribution has been made, and if the inventor is the first and real inventor of the device to be covered by the application. If it is determined that the device is new and patentable, letters patent will be granted upon the payment of the prescribed fees. When the patent is granted, the Government gives to the inventor the right to complete monopoly of his idea for a period of seventeen years. It is almost impossible to renew such patents, for the simple reason that only Congress has the right and power to do this.

It is written in the law that the only object of the whole patent system of this country is that of bringing about progress to art, science and mechanics. In its essence, the Patent Law cares little for the individual; it is society as a whole with which it is concerned. However, the law gives some reward to the patentee merely because it was felt by the framers of the Constitution that we would have very little invention if some sort of incentive could not be given to inventors.

This version of the Patent Law and patents in general is a long way from the popular misconceptions held by thousands of inventors throughout the land. To many of them a patent paper with its red seal, blue ribbon and official stamp of the United States Government is a guarantee of protection and places the Government squarely behind the inventor. Actually,

it does nothing of the kind and was never intended for anything like that.

If the Government and the inventor, working together, can prove that an idea is new, then complete monopoly results for the inventor and infringers must pay. However, the mere issuance of a patent is no guarantee of this result. The Government experts and examiners in the Patent Office may have overlooked some important references, or another inventor who has been working secretly may come forward with a date of conception showing that he had the idea first, which would be enough to invalidate a patent even though it had been issued.

The writer recalls an instance that happened some years ago. An inventor came to him for some advice in connection with the exploitation of a patent which had been issued by the Patent Office some months before. The idea was clever and it was new but the writer said frankly that he did not think the inventor could even manufacture his own invention, let alone sell it. The man had made a certain perfection on an idea that had already been patented and the patent was a very strong one, having been defended in court several times. This first patent dominated the second and if the inventor sold it at all he would have to sell it to the people owning the first patent.

The owners of the first patent, however, could not apply his improvement themselves without buying it, but they could prevent his applying it or his selling it elsewhere.

Such cases are not common but they come up occasionally and this one is mentioned to help the reader gain a clear impression of the limitations of the Patent Law. In its essence, the Patent Law does a great deal to protect the inventor, but it is well that the prospective inventor thoroughly understand that there is a distinct limit to this protection.

As has been stated before, the only advantage that a patent affords is the right to sue; the right to bring an infringer into

court. There is not another feature that it provides. Naturally, the man who has in mind selling his invention without a patent wonders how it would be possible for him to obtain any protection at all; he might feel that he was utterly helpless in the face of infringement.

This is far from being the case. Indeed, this man is almost as able to protect himself as a man with a patent, for he has at least proven one thing and that thing is of great moment: he has proven that he had an idea on a certain date and that gives him the right to apply for a patent and to have that patent issued over the patent that might be applied for on the same idea, but with a later date of conception. Thus should an idea be infringed under these conditions the inventor would immediately apply for a patent and then sue the infringer when the patent had been issued. In a practical sense he then has the same right as a patentee except that it will take him a little longer to bring the necessary legal pressure upon an infringer.

How to Safeguard Your Inventions

THE CAREFUL INVENTOR should keep a complete record of the development of his invention or the progress of his research work. As we have seen, the granting of a patent is nothing but the recognition by the United States Government of the fact that a certain individual was first to conceive a certain idea and to reduce it to practice. If an invention is patented, the patent can be rendered invalid if another inventor comes forward with conclusive proof that he was the first one to conceive the idea. Many important cases have rested on the proof of priority. Therefore, it is necessary for the careful inventor to keep a definite record of his idea so that he will have legal evidence of priority should he apply for a patent and find that he is in interference with another application similar to his own. If the records he has kept are in good legal form he will have a chance to obtain an advantage over his contemporary. However, if the contemporary also has evidence that he conceived the idea on a certain date which happened to be before that of the second application he will have the right to continue with his patent work.

In this chapter we will outline a definite procedure which the inventor may follow in keeping records of his work that will stand the test of litigation. If he has trouble proving that he has been the first to conceive of his invention he will find such records of utmost value. If he carries his idea out successfully and obtains a patent covering it this should by no means be a signal to destroy the patent records, since they may prove valuable at a later date if someone should come forward with records to show that they were the first to have the idea.

A general summary sheet should first be made up in the following manner:

1. Name of invention or machine:
2. Date conceived:
3. By (name of inventor):
4. Date disclosed:
 - (a) Witness (How disclosed)
 - (c) Witness (How disclosed)
 - (b) Witness (How disclosed)
5. Dates of sketches:
6. Dates of written description:
7. Dates of working drawings:
8. Date of starting on machine:
9. Date of completion:
10. Dates of photographs:
11. Date tested:
12. Where tested:
13. Results of test:
14. Date matter was placed in hands of patent attorney:

The inventor will see that this summary sheet contains a complete record of the entire invention. This is kept as a general check and other records which will be described later are made up as further evidence.

When the inventor first conceives of the idea he should at once start to fill in his summary sheet. After having worked out the idea in his mind the next step is to tell another person about it. The inventor should be careful to see that he picks some trustworthy, honest friend to whom he may disclose his idea with safety. So many inventors have a false idea of secrecy. They think that their work should be wrapped in utter mystery. True, the cautious inventor is reasonably careful to see that the world at large does not know what he is doing, but there is no reason why he should not disclose his idea to several friends so that they may act as witnesses to the

fact that he was first to conceive the idea. In fact, if they sign the summary sheet as witnesses they could not possibly steal the idea if they wanted to, since they have already committed themselves.

In the case of an extremely important invention, the inventor should try to give another member of his family a complete working idea of his invention so that they would be able to carry out its development in case of the inventor's death or his inability to complete it for any other reason. Oftentimes the assistance of a trustworthy friend can be obtained in his way.

Following the outline contained in the summary sheet the next record to fill in after the witnesses have been obtained follows. This record may cover research work or it may cover the actual development of a device which the inventor has worked on to perfect.

1. The object of the invention or research work carried on:
2. Apparatus or machinery used:
3. Materials employed:
4. Methods or process:
5. Results obtained:
6. Development work by (inventor's name):
7. Witnessed by:
 - (a) Witness's name.
 - (b) " "
 - (c) " "

We must next concern ourselves with the keeping of a drawing record. This record should be made out as part of the general record.

1. Supersedes drawing date _____
2. Name of invention:
3. Operation to be performed by invention:
4. Drawn by (name of inventor or draftsman):
5. Date drawing started:

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6. Date completed:
7. Witnessed by _____

Another valuable record should be kept showing the materials or parts purchased for use in carrying out the research work. When the inventor buys certain materials or parts to use he should obtain a receipted bill and these bills should be kept with the rest of the records.

The next record is an outline of the progress of construction. This should be called the Construction Record Sheet. The information given on this sheet should be enumerated as follows:

1. Model started:
2. Model completed:
3. Raw materials ordered (date):
4. Raw materials received (date):
5. Raw materials used (date):
6. Pattern ordered (if any):
7. Pattern received (if any):
8. Castings ordered (if any):
9. Castings received (if any):
10. Witnessed _____

A separate sheet should be made out covering the actual testing of the machine or invention to prove that it is constructed properly. Form for this record follows:

1. Date:
2. Description of machine:
3. Result of test:
4. Photographic views taken during test:
 - (a)
 - (b)
 - (c)
 - (d)

HOW TO SAFEGUARD YOUR INVENTIONS [25]

I, _____ swear that the foregoing is true and correct to my personal knowledge.

Signed _____

State of _____ County of _____ ss

On the _____ day of _____, 19____ before me, the subscribed, a Notary Public, in and for said county, personally came _____ and swore to the foregoing facts as true and correct.

Notary Public in and for
_____ County

This form should be taken before a Notary Public and duly signed and witnessed.

Another form, which is a statement by the witnesses of the test, should be made as follows:

I, _____, on the _____ day of _____, 19____ first being duly sworn, state as follows:

I was a witness to a test of _____ on the _____ day of _____, 19____, at _____ A.M./P.M., in the City of _____, County of _____ and State of _____.

Signed _____

State of _____ }
County of _____ } ss

On the _____ day of _____, 19____, before me, a Notary Public, in and for said county, personally came

_____, _____,
and swore to the foregoing facts as true to the best of his knowledge and belief.

Notary Public in and for

_____ County, _____

Photographic record sheet as follows:

1. Name of device: _____
2. Place: _____
3. Date: _____
4. Photograph taken by _____
5. Who present _____

It is well to mention here that the progress of construction should be photographed occasionally so that a complete record of the construction of the machine will be had in pictures. All the negatives should be carefully preserved and kept with the rest of the records.

It is to be understood that complete invention records of this kind should be kept only when a very important piece of work is being developed. It is quite unnecessary to go to all this trouble when a simple little commodity, which is of no great industrial importance, is being developed. However, the inventor should always take precautions to have his idea witnessed when he first conceives it, whether his invention be trivial or extremely important. A statement to this effect, properly witnessed, will at least prove the exact time that the idea was first conceived and this is of importance in cases of interference.

Many inventors have asked the author how they can obtain preliminary protection for their ideas without appealing to

a patent attorney. There is a very simple way to do this. Since the Patent Office recognizes only priority, all the inventor needs to do is to establish his date of conception.

The inventor should first write a complete outline of his invention, describing its details very carefully. One or two pages of description will suffice. A sketch of the proposed construction of the device or mechanism should be included.

When this is done, the inventor should attach his signature to it, with three friends acting as witnesses. The friends should also sign the paper as witnesses.

The paper is then folded and placed in a self-addressed envelope. Sealing wax is used to close the envelope. The inventor then goes to the Post Office, registers the letter with a return receipt requested and posts it. The letter will reach the inventor after having passed through the Post Office. In passing through the Post Office the letter has affixed to it an impression of the date stamp. Uncle Sam's official date stamp is a very valuable thing, and when the inventor receives his letter he should put it in safe keeping. If should, of course, be left sealed, since its value depends upon this.

This procedure establishes priority almost beyond question.

There is still another way of obtaining this official stamp of the United States. Instead of being placed upon an envelope, the date stamp can be placed directly upon the paper bearing the drawing and description of the invention. Legally, this is a much better system and is usually beyond question by any court.

To do this, the inventor makes a drawing of his invention and writes a description of it all on one side of the paper. The paper is then folded in the form of an envelope and glued. If this is then sent by registered mail, the United States official date stamp is placed directly upon the paper bearing the disclosure of the invention.

The importance of this date cannot be overestimated. It is *all* the invention has in the way of protection. It must be able to

stand the closest scrutiny; it must be iron-bound and the more that is done to make this date official, the more protection the inventor will have, provided, of course, that his invention is new and original and a real contribution either to mechanics or science.

Alert inventors looking for methods of obtaining protection for their ideas may also take advantage of filing their inventions in the United States Copyright Office which involves a fee of \$2.00. The inventor sends to the Registrar of Copyrights, Library of Congress, Washington, D.C., for form A7 which is sent free of charge. He then has a description of his invention made either by typing, mimeographing or other method not involving the use of set type. A drawing is also made and a photograph if the inventor so wishes. The form A7 is then filled out, witnessed before a notary public and filed in the Copyright Office with the necessary fee.

Any one of the above forms of protection may be used by the inventor to establish his date of conception which is absolutely necessary if all of the inventor's common law rights are to be preserved and guarded.

Whether or not any new idea is valuable depends entirely upon the records of the Patent Office. When an inventor gets an idea, that idea is *worthless* if there is a patent in the United States Patent Office that anticipates the same result. The thing *must* be new.

Every inventor, then, whether he plans on selling his invention in unpatented form or whether he intends later to apply for a United States Patent should have the files of the Patent Office searched by a competent person. In making this search, this person will supply the inventor with copies of patents covering inventions that might anticipate even in a small way his own invention. These copies of patents will be turned over to the inventor so that he may see whether or not he has infringed an idea already patented either in this country or in other countries.

The Ten Most Needed Inventions

SOME ONE HAS SAID that the future security and happiness of the human race lies in the hands of those who labor behind the closed doors of the laboratory. The complexity of modern life and its absolute dependence upon the inventions in use at the present time prove this beyond a reasonable doubt. The struggling, puffing locomotive with its long string of food-laden cars is an invention of such great importance that its failure would bring about an appalling disaster; millions would starve to death within a few weeks. The failure of any one of our modern sources of power would likewise expose us to great danger.

America has led the race in invention and the world looks to her inventors to supply the great industrial needs of the day. Indeed, the future prosperity of our nation depends not so much on the business man as upon the inventor. The inventor is the creator, the business man the exploiter. *And we must keep on inventing.* Lack of invention leads quickly and surely to racial unimportance.

In outlining what are considered to be the ten most needed inventions, the writer is hopeful that they shall come to the attention of a large number of students of science and engineering.

Power is to the world what lubrication is to an automobile. It is the stuff the world "runs" on. We cannot produce energy in the strict sense of the term; we can only transform it. We burn coal to transform the solar energy that was stored in it millions of years ago. Man creates nothing. He can only change the things he finds in the earth.

Now in changing energy from one kind to another we are like a careless child trying to pour milk from one bottle to

another, spilling most of it. We are wasteful but we must be forgiven because we don't know better. Since energy is the most fundamental thing in civilization today, the first most needed invention is one that will allow us to transform energy into power with less waste. Today we only succeed in getting about ten per cent of the available energy out of coal. The gasoline engine is only about 20% efficient. In fact, everywhere we turn we meet this appalling waste of energy. Who will stop it and how will it be stopped?

We simply need more efficient methods of transformation. When we produce energy by burning coal, for instance, we transform it twice and each time we lose a healthy percentage. First, the chemical energy represented by the oxidizing carbon is liberated as heat which is used to boil water and produce steam. This in turn is fed to a steam engine which converts the heat energy into kinetic energy and finally electrical energy is produced through the agency of an electric generator.

Why cannot this electrical energy be produced direct from the heat of the coal without introducing any moving mechanism? Seeback showed us one way in which it might be done. It was in 1821 that he performed his classical experiment on thermoelectricity. He showed that an electric current is produced when the junctions of two dissimilar metals are heated. It is an experiment that can be performed by any inventor who is in possession of a small current-detecting meter. Two pieces of wire, one copper, one iron, are twisted together. The free ends are connected directly to the current-detecting instrument. If the ends are held in a small flame such as that produced by a match or alcohol burner, a current will be registered. Any text book on physics will tell the rest of the story.

What is the second most needed invention? Any engineer with a sound knowledge of modern industrial conditions will hold that some method of storing energy is needed. The storage battery of today, although developed to a high degree of perfection, has low efficiency and the unit of power delivered after each charge is small compared to the unit of weight. If a small,

light container for electric power were invented, transportation would be revolutionized. Say we had a device weighing about five pounds which would deliver twenty horsepower of energy for a period of twenty hours? The electric motor with its quiet running and high efficiency would almost immediately replace the unsatisfactory gas engine. Electric locomotives could be driven without the third rail and electric airplanes would take the place of the gas operated machines of today. The power of the tides is too erratic to be harnessed to the needs of industry. With an efficient storer of electric energy, we could build wave motors and tide-operated turbines which would follow the lunar cycles faithfully so that the general routine of industry would not need to be changed. During the night, all of the water of Niagara could be made to pass through turbines connected to powerful electric generators that would make currents to be stored away for the next day's use. Then we could save some of our coal and in place of wasting it under boilers as we now do, it could be burned in by-product ovens for the recovery of the many valuable chemicals it contains.

But what about atomic energy? We have heard a great deal about this lately. The writer has not considered it for the simple reason that he does not believe it will come into use in the immediate future. What would happen if it were released tomorrow? The world would certainly not be using it the next day or the next year. Would we immediately scrap all of our power-producing instruments, bankrupt our industries and prostrate our production facilities? It must be remembered that revolutionary changes come slowly when they require such radical departures in equipment. The writer has held himself down to descriptions of things that could be done with reasonable speed. If we could store electricity more efficiently, the same electric motors that we have today would be used.

Although it may not be third on the list of importance, cold light must be considered as one of the ten most needed inventions of the day. Our present electric lamps give off only 8% of light. The remainder of the energy is wasted as useless heat—

92% of it. If some inventor could reverse these figures, giving us a light that produced 92% illumination and 8% heat, we would save several billion dollars' worth of electric power annually. Perhaps future light in our homes will be supplied by causing some invisible radiation to make walls phosphoresce.

The perfection of a more rapid means of transportation is without doubt an invention that really belongs in the list of ten. This does not necessarily refer to the perfection of the airplane. In this connection, the monorail is again suggested as a possibility. Then there is magnetic levitation which has been experimented with as a means of overcoming both the problem of friction and high traction power. Our civilization is becoming more and more dependent upon fleeting vehicles. Like atomic energy engines, here is something for the future.

What is number five? The wireless transmission of power fills this space. Here, too, is a development that would not necessarily disturb our present scheme of utilizing power. It would simply mean that we would tear down our expensive and unsatisfactory high-voltage transmission systems. The economic importance of an invention of this nature would be difficult to overestimate. Many rich and beautiful regions of the world are now closed to civilization because no sources of power are available. Since energy is the raw material from which all of our luxuries come, every section of the world would be worth living in if a continuous supply of power could be delivered without depending upon transmission lines.

The successful control of distant mechanism by radio impulses is also one of the greatest things that could happen in our time. We have developed systems that work fairly well but none reliable enough to withstand the strain of commercial application. Tesla said not long ago that we would soon be sending crewless ships across the ocean to any port in Europe. Radio-dynamic control would make that possible, releasing at the same time hundreds of thousands of marine workers for other duties. Regardless of all that we read in the newspapers, this is still a major problem.

Great things would come to the human race if we should find a method for the transmutation of matter. It has already been on a small scale in the laboratory. Rutherford succeeded in changing nitrogen to hydrogen by taking electrons away from the atom of the former by bombardment. He did the same thing with a number of other elements, proving beyond the shadow of doubt that man will soon be making matter up to suit himself. Today, through the use of the cyclotron, transmutation is almost a daily occurrence but the amounts of the elements transformed are exceedingly small. The transmutation of matter will teach us to make up entirely new matter; that is, we will be able to make elements that do not exist at the present time. Engineers will go to our chemists and metallurgists and ask them to design a new metallic element for certain purposes and to withstand certain strains and stresses. With this great invention, we would need have no fear of the future supply of raw materials.

Television, already an accomplishment as far as the solving of many major technical problems is concerned, may nevertheless still be listed among the ten most needed inventions because the industry is as yet in a stage comparable to the automobile thirty years ago—that is, the application of basic principles needs to be refined, streamlined, made practical in the mass. A personal television receiver that would fit into a vest pocket; a television attachment for the telephone so that you could not only see the person at the other end of the line but could also view documents, records, etc., involved in the conversation; television units that would automatically and permanently record both the visual and audio components of a conversation and thus serve the purpose of records, wills, contracts, and the like—these and hundreds of other applications mean that television, now an infant, will be a fruitful field for the inventor for a long time to come. In fact, in the search for compactness, portability and greater efficiency it is entirely possible that some inventor will turn up with a television principle vastly different from those now used.

Still another great invention lies in the medical field. The writer refers to a discovery that would cure tissue-destroying diseases like cancer and X-ray burns as well as tuberculosis. Such a thing would save millions of lives yearly and at the same time bring a new ray of hope to the entire race.

Artificial or transplanted eyes that would allow people to see might well be counted in with the ten most needed inventions. The same would be true in connection with a device that would overcome deafness.

The reader will understand that this is the writer's version of the ten most needed inventions. Of course, anyone is entitled to an opinion. In making the choice the writer was guided largely by what he knows to be the opinions of some of our greatest thinkers and research workers in the field of science. In reading the article, it will be noticed that every one of the inventions mentioned would have a far-reaching effect upon life in general and each one bring greater happiness to the greatest number of people. That is the ultimate goal of civilization.

General Problems

1. A smooth road that will not be slippery in wet weather.
2. A furnace that will give off 95% of the energy in the coal as heat.
3. A noiseless typewriter that will be truly noiseless, light in weight, yet capable of making numerous carbon copies.
4. A process to make flannel unshrinkable by washing.
5. A key that will not lose its identity.
6. A smoking pipe that can be easily cleaned and that will have none of the disagreeable features of present pipes.
7. A still better process for making motion picture films speak, cheap enough to use in inexpensive amateur movie cameras.
8. A simplified method of producing clothing that will not be strange in appearance but that will eliminate many of the tedious hand operations now in use.
9. A method of conveying speech directly to paper without the aid of a stenographer.
10. A domestic cooking stove where the heat is focused largely on the material being cooked.
11. A horseshoe that will prevent horses from slipping on icy or wet pavements.

NOTE: Inventions marked with an asterisk (*) are of especial military importance.

12. A fire grate giving cheerful open fire effects that will at the same time be an efficient and comfortable heating system—most fireplace heat is now wasted up the chimney.
13. A successful tide-water motor for the harnessing of ocean power.
14. A combination heating and cooling system for the home. It would seem that the hot water system could be connected for summer time use so that cold water circulation through the pipes would reduce room temperatures. The same might be true of hot air furnaces. A radiator could emit cold blasts of air instead of warm ones.
15. A noiseless washing machine.
16. We have bells on typewriters for indicating the end of the line but nothing so far has been developed to indicate the end of the page. All the typewriter manufacturers are interested in this problem.
17. An automatic process for candling of eggs.
18. Upholstering that will never sag or get out of shape.
19. A method of laying wooden floors so that they will never squeak.
20. A cheap and reliable magnetic door check.
21. Cold is a relative term and the coldest atmosphere in the winter time has considerable heat in it. If this heat can be extracted a means for heating at low cost could be found.
22. A machine that will lay bricks semi-automatically.
23. A semi-automatic filing system which will permit of rapid selection and location.
24. A wall-papering machine that will be successful in the hands of an amateur.

25. An attachment for a cash register which will automatically reject counterfeit coins.
26. A cheap check protector which it will be absolutely impossible to render ineffective.
27. A candy box that cannot be used again for any purpose once it has been opened.
28. A means of sealing cigarette packages hermetically. This might be done with some sort of a preparation into which the packages might be dipped and allowed to dry.
29. A fountain pen that will always have a sufficient quantity of ink at the point with no possibility of becoming clogged or of flooding.
30. A simple attachment that can be placed on a moving picture machine and which would produce the stereoscopic (three dimension) effect from standard films would be worth millions of dollars.
31. A more humane method of grinding teeth for the purpose of dentistry. Indeed, a solution might be invented which would dissolve the bony structure of the teeth. A great deal of the pain from present dental burrs comes from the heat developed from friction with the tooth. A method of keeping the burr and tooth at body temperature would help minimize pain.
32. Improved instruments for testing paper. Rupture tests are especially important and more accurate devices for measuring the forces necessary to disrupt the fibres of paper are needed.
33. Better system of electric mine ventilation that will assure a plentiful supply of fresh air to the most remote corners of the mine.
34. The U. S. Bureau of Standards has found through investigation that stucco-covered houses are not practical north of

Baltimore owing to the extreme change in temperature between summer and winter. Some kind of an ingredient mixed into the concrete to prevent cracking would be welcomed by the concrete interests.

35. A more effective method of anchoring ropes and cables.
36. A method of constructing railroad coaches so that it would be impossible for them to telescope in collisions.
37. A rapid means of removing snow from the sidewalks of large cities. This might be done by placing steam-heating pipes under the walk that would melt the snow as fast as it came in contact with the concrete.
38. Straw hat that will not become discolored by sunlight.
39. A match that will not shoot off heated particles when it is lighted. One that would keep flaming on a windy day long enough to light a pipe would be welcomed by smokers.
40. An electric fire detector that will go into action immediately when the process of oxidation takes place near it.
41. A check book for bank patrons that will allow the account to be kept accurately with minimum effort
42. A negative-identifying autographic camera that will eliminate the carbon paper used, that will not require exposure to light for printing, and that will be compact enough for miniature cameras.
43. Olives, pickles and similar foodstuffs are customarily sold in glass bottles with screw caps which are affixed so tightly by the manufacturer to prevent leakage that it is often difficult to remove them by the hands alone. If a folding lever could be provided as part of the cap to give leverage to the fingers, then the cap could be easily unscrewed without the aid of mechanical openers.

44. A silencing device for compressed air drills and riveting machines is badly needed. It should not add to the weight of the machine.
45. Simple automatic and portable brick conveyor for use in constructing buildings.
46. A method of hardening copper without the introduction of other metals as alloys.
47. A new material for road construction or a new way of road building that will be practically indestructible. Much road destruction arises from water getting into crevices, freezing and expanding with irresistible pressure.
48. A leak-proof, high pressure pipe joint.
49. A theft-proof coin changing machine would be welcomed by slot machine vendors and particularly telephone companies for use in isolated booths where there are no attendants. The device should deliver the proper number of nickels for quarters and dimes.
50. A better method of insulating boilers thermally so that a very small percentage of the useful heat will escape by radiation.
51. A non-staining water-proof material for cementing and pasting purposes.
52. A child's toy steam engine that will not need heat but will imitate engine noises.
53. A more accurate and simple flow meter which will measure the amount of water or liquid passing a given point.
54. A positive burglar-proof bank in which each employee will have a certain amount of protection.
55. A way of preventing the dropping of plaster ceilings in apartment houses in large cities.

56. A golf ball that will have the same life as those now used but which can be manufactured from different material and more economically. Cheap practice balls are needed.

57.* A gas alarm that will immediately ring a bell when the atmosphere becomes polluted with illuminating or other poisonous gases, some of which are odorless. The human nose is an unreliable organ of alarm since the sense of smell quickly becomes "blind" to continuous odors.

58. A cheaper and more rapid method of reclaiming used oil.

59. A house constructed with walls of material that cannot be penetrated by heat waves. This will make the house warm in winter and cool in summer.

60. A method of ventilation that will remove stone dust and prevent silicosis in stone cutting.

61. A means for precipitating the smoke from steam locomotives. The Cottrell System of electrical precipitation might be applied.

62. Trunks are now assembled by hand riveting and all of the trunk makers are keenly interested in a machine that will do this work automatically.

63. A means of anchoring hairs in brushes so they will not become dislodged.

64. A non-electric system of ventilation for small kitchens. This should keep the air smelling sweet and clean and free from the odor of cooking.

65. An onion peeler which would enable housewives to prepare the vegetable without smarting eyes.

66. A better opening for incinerator chutes such as are used in apartment houses which will receive the contents of an entire wastebasket in one operation and will not clog or come loose at the hinges, as is the case with present devices.

67. A vacuum cleaner attachment that will pick up the lint from the floor without in any way damaging the carpet.

68. A water pitcher so arranged that ice will not come in direct contact with the contents.

69. An automatic window closer. This should close the window at a pre-determined hour so that the room would be warm when the occupant arose.

70. A bottle cap that will not leak over a period of at least one year.

71. Sugar dispenser that will keep sugar clean and instantly available. Should eliminate the use of spoons.

72. There is still need for a simple and inexpensive self-inking rubber stamp.

73. A really snag-proof silk stocking for women would appeal to every woman in the country.

74. A pipe that will clean itself during the process of smoking.

75. A way of making furniture so that steam heat cannot cause it to become loose and rickety.

76. Improvements in grinding of lenses so that the lenses that are now expensive may be sold for a more reasonable figure.

77. A non-rattling window.

78. A means of making oilwells safe from explosion and fire.

79. Carpenter's saw that will throw out sawdust, thereby making sawing easier.

80. An efficient combination cross-cut and rip hand saw.

81. A better way of reproducing books in Braille (raised symbols) for the blind. The present method gives books of extreme bulk.

82. A way of preventing the escape of coal gas from stoves and furnaces, especially hot air furnaces.
83. A typewriter so constructed that it will have about half the number of parts of the present machine without any reduction in efficiency.
84. Collapsible paste tube that will be self-closing.
85. A way of binding books that will prevent breaking of the backs.
86. Large piles of coal held in storage are apt to break out in fires through spontaneous combustion. Such fires are very difficult to extinguish. Some means of preventing such fires is needed.
87. High temperature drying plants using heated mercury vapor in place of steam.
88. Effective spark arrester for locomotives.
89. A pencil sharpener that will not waste the pencil and that will produce a more perfect point, exposing more of the lead. It should not break leads, as the present type of sharpener frequently does.
90. A paper collar that will look exactly like a linen collar.
91. A design for a street car or bus that will facilitate the entrance and exit of passengers.
92. Legs that will automatically level billiard tables.
93. A rapid means of protecting passengers on the tops of buses from rain. A canopy of some kind that can be put in place by one man is needed.
94. A dentist's drill is not cleansed as much as it should be in antiseptic solutions because of the fact that it is oiled and its design does not permit of this abuse. A sanitary drill is one of the things that dentistry needs very badly.

95. A simple egg beater that will be easy to keep clean.
96. A more efficient gasoline-driven saw for felling trees.
- 97.* A better means of signalling between submarines while they are submerged. Radio has proven ineffective but some success has been had with sound-producing devices, since water is a very good conductor of sound waves.
98. The invention of a type font for music printing is one of the great needs of the day in the printing industry.
99. A new method of hanging windows so that there will be no possibility of sticking or loss of the counter-weights.
100. A rapid method of drilling glass without danger of breaking.
101. A washerless water faucet which can be guaranteed leak-proof for a life time.
102. A railway wheel that will not become flat.
103. A means of preventing rugs from rolling up at the corners.
104. A cheaper means of covering steam pipes with heat insulation.
105. A monkey wrench that will not slip on round objects and on the other hand, one which will not tear great chunks of metal from the surface of the object being worked upon.
106. A means of automatically setting pins in a bowling alley that will entirely eliminate the use of pin boys.
107. Cheap and simple hand-operated tool for scraping floors. Something that will work faster than the present tools is needed.
108. A garterless sock that will stay up and fit the calf snugly without the need of elastic.
109. A better means of plating objects with brass so that any thickness of deposit can be made.

- 110. A paving brick made of cheap but highly durable materials.
- 111. A folding, all-metal step ladder that would sell at a figure only slightly above the present wooden ladders.
- 112. A more rapid typesetting machine for use in connection with multigraph office printers.
- 113. A means of upholstering that will outlast the present system. For instance, a chair should be produced that cannot become uncomfortable through loss of its original shape and softness, and in which springs cannot sag or become untied.
- 114. A better hand-operated non-electric vacuum cleaner.
- 115. An improved camera tripod that will be light but rigid. Vibration is fatal to picture taking and yet the real portable tripods are so light that they vibrate very easily.
- 116. Improved means of tunnelling with compressed air and caissons.
- 117. A rapid means of puncturing holes in glass with high voltage electric current.
- 118. Lead pencils of the softer grades that will not break easily.
- 119. Means of attaching hammer heads to handles so they will never come off.
- 120. A wooden door that will not twist, warp or sag.
- 121. Fruit jar cover that will not stick.
- 122. New jazz musical instruments that will produce new effects. This does not mean that the devices should produce ridiculous noises but should have some musical value.
- 123. A water-proof adhesive tape for covering cuts on the hands.
- 124. A permanent saxophone reed made of something better than bamboo which is at present used. The reed should last a lifetime.

- 125. Sky rockets so constructed that they will not be able to do any damage should they strike a person upon descending. The same need exists for rendering the shrapnel of anti-aircraft guns harmless when it falls to the ground after the shell explodes.
- 126. The Liquid Carbonic Company will pay \$1,000 for the discovery of a new use for carbon dioxide gas or for improvements to present uses that will produce for the company additional gas sales of at least 200,000 pounds a year.
- 127. A drafting compass of the fountain pen variety.
- 128. Aviation engineers believe that air travel of the future will be through the stratosphere, the rarefied air region five miles above the earth. Practically every large aircraft builder today is looking for improved solutions of the problem of how to make stratosphere cabins hermetically sealed against cold and comparative vacuums, and how to provide an artificial atmosphere which will keep passengers comfortable at all times.
- 129. The perfect answer to the shaving problem is yet to be devised. A razor with a small reservoir containing a beard-softening substance which it would apply as the shaving strokes are made would win an army of converts, as most men dislike the time-consuming fuss of spreading lather or cream.
- 130. An umbrella that can be absolutely guaranteed against turning inside out during a wind storm.
- 131. A moulding system whereby papier mâché articles of various shapes can be produced rapidly.
- 132. Improved method of washing soda fountain glasses so that they may all be done in one operation. Soap or some powerful solvent should be used.
- 133. Interior decoration is still complicated by the presence of bulky, awkward steam radiators. A streamlined radiator which would fit snugly and ornamentally against the wall where it would not interfere with furniture but would still be efficient,

would be a winner. A design light enough to be entirely removed, perhaps in sections, during warm months would be an added feature.

134. Practical monorail railroad of the suspension type for high speed city and interurban traffic.

135. A new type of lead pencil that can be sharpened without a knife. This does not refer to the expensive magazine pencils. A pencil should be developed that will be built in sections of wood or paper so that the removal of each section will expose a new point.

136. Better way of attaching cables to elevators so that there will be no tendency toward crystallization which causes cables to break. The joints should be flexible.

137. Sink trap that can be cleaned externally.

138. A cheap home incinerator for back yard use which will leave nothing but the ashes to dispose of. Such a thing would be used largely on country estates.

139. Means of washing high windows without danger to the washer.

140. A method of surfacing tile floors to eliminate the slipping of leather heels.

141. A method of permanizing pulp paper of the cheap type used in newspapers and inexpensive magazines. At present such paper deteriorates rapidly. If inexpensive, publishers would welcome it.

142. An electric ice box unit with no moving parts and with fewer parts is needed.

143. A refrigerating device for campers that will not need ice.

144. A non-breakable phonograph record built around a matrix.

145. The lenses in round tortoise shell rims sometimes turn in the frame due to temperature changes. This causes severe eye strain to the user. There should be a means of preventing this.

146. A detachable sidecar or back seat for a child's tricycle would be very popular with parents who wish to accommodate more than one child at minimum expense.

147. A colored magazine cover is reproduced in four-color process from an original water-color drawing. The inks used in printing are yellow, red, blue and black, requiring four different plates. When photographing the original drawing, filters are used in front of lenses to separate colors. For the yellow plate, a purple filter is used to eliminate blues, purples and magenta reds and to emphasize yellows, orange and yellow green. An orange filter is used for the blue plate to strain out all red, orange and yellow and to strengthen blue, green and cold colors. Greenish yellow filters are employed to make black plates, eliminating a little of all colors and emphasizing blacks or near blacks. Last, for the red plate, a green filter is used, eliminating green and near green and giving strength to red, pink, deep orange and violet. Dry plates and emulsions have not proved entirely satisfactory, especially for the plates and filters for the red.

148. In making a halftone plate our greatest problem is to get a true and absolute photographic reproduction of the copy. By staging and fine etching, you could turn out a more or less mechanical reproduction and lose photographic values. A high negative could be made and staging done away with, but you would lose in the middle tones and light middle tones, and again lose copy value. If we could turn out a finished plate and a true reproduction of copy, in a one-depth "bite" (of the etching acid), it would result in a great saving in present cost.

149. A method of making piano frames for the holding of wires so there will be no danger of warping or giving under the heavy

tensions used. The frame should have a minimum amount of metal in it.

150. A means whereby blind people will be able to read books in ordinary type. A system was brought out in England some time ago based on photoelectric effects but it was too expensive to be used widely.

151. A small gasoline driven rock crusher that can be used by contracting concerns for small jobs. It should be driven by no more than a 20 horsepower engine.

152. A disposable paper bag to collect dirt in vacuum cleaners, adjustable to any model. Present bags are usable only on particular machines they are specially designed for.

153. A device that will produce accurate stitching on the principle of the sewing machine but so small that it could be placed in a suitcase.

154. The composition used in the manufacture of artificial tortoise shell glasses is very easily broken. Some ingredient should be introduced into it that will make it less susceptible to fracture.

155. Any invention that will reduce the number of parts in a linotype machine will be worth considerable money to its inventor.

156. Improvements in glass blowing machinery are needed. This should make for more rapid production with less breakage and fewer imperfect articles.

157. In cold, dry weather the printing industry suffers considerably from static electricity which makes the paper behave badly in feeding. A means of neutralizing this static is one of the requisites of the industry.

158. A belt dressing that will not only lengthen the life of the belts but give them greater tractive effort on pulleys.

159. Better means of protecting windows from burglars. Iron bars are more or less ineffective due to the efficiency of modern metal-cutting tools.

160. Cheaper and more effective thermal insulation for ice boxes.

161. Oil readily attacks rubber, causing it to decompose rapidly. Oil-proof natural rubber would be a major invention.

162. One of the greatest troubles with spring motors is the difficulty of preventing spring breakage. A new principle spring motor that will overcome this will find wide use. Beryllium alloys strengthen such springs greatly, but a new principle would eliminate the need for costly alloys.

163. A means of producing an imitation parchment paper that will defy detection.

164. Tile-laying machine for the smaller tiles such as those used in bathrooms.

165. A cheap power-driven orange and lemon squeezer.

166. An absolutely fire-proof gasoline and oil storage tank.

167. Practical improvements in portable power saws for tree cutting.

168. Improvements in road-laying machinery that will make for speed.

169. A means of recovering drills lost in drilling oil wells.

170. A thief-proof fence that will frustrate ordinary attempts to enter private property.

171. Bullet-proof insulators for telegraph poles. Hunters seem to take a great delight in popping off the green glass insulators now used.

172. A noiseless lawn mower.

173. A means of exploring our nearest but most unknown land—the earth under our feet. Who knows what untold wealth may lie a couple of miles beneath us? In the eastern section of the country, about 8,000 feet is the extreme limit of penetration of the earth's crust.
174. Method of making cast iron tanks absolutely leak-proof to kerosene, something that cannot be done at present.
175. Better distribution of ink so that printing will be uniform.
176. At the present time gas flames are used in drying large sheets of color printing as it comes from the press. It should be possible to do this electrically or to cause instant drying by means other than the use of heat.
177. Some sort of a compound added to the metal that will prevent bolts from rusting in place.
178. Machine to facilitate asphalt laying.
179. Sanitary transparent composition milk bottles cheap enough to be used only once.
180. Can opener attached to each can that will guarantee results. The present key method is not entirely satisfactory.
181. Ingredient for concrete that will prevent cracking.
182. Glasses with special lenses so designed as to enable color-blind individuals to have normal vision.
183. Individual saliva ejector for dentists.
184. A non-rusting metal window screen that will hold its shape.
185. Non-chipping enamel ware for kitchen utensils.
186. A leak-proof, noiseless valve for radiators.
187. A solution to remove the film from mahogany furniture.
188. Fool-proof sewing machine that will not break or tangle thread.

189. A moth-proof substitute for the felt now used in pianos.
190. A cheap insect protector for trees that can be used more than one season.
191. A self-oiling clock where the oil can be put in one place.
192. Oftentimes heavy machinery will have some part out of balance or out of alignment which will cause it to vibrate badly. A device that will be able to locate this trouble would save much time and expense.
193. High speed steam turbine bearings usually run on oil under pressure. The failure of this pressure causes accidents and some means is needed to overcome this possibility.
194. Better method of changing colors in stage lighting.
195. A method of storing and changing scenery more rapidly than is now possible.
196. Better acoustic construction for theatres and auditoriums. This is a problem that can be worked out with models.
197. Automatic band saw sharpener that will work fast.
198. A burglar-proof satchel for bank messengers.
199. Burglar-proof bank vault that will be cheap to build.
200. Indestructible platen for typewriters that will not lose its resiliency for a lifetime.
201. Vacuum-type street cleaner that will actually pick up the dirt and load it into wagons or trucks.
202. Snow plow built on vacuum principle.
203. Self-lubricated valves for gas stoves that will never be affected by heat and that will always function easily.
204. A practical electric generator plant driven from a wind-mill for farm use.

205. A toy similar to Structor or Erector that will not use bolts or nuts.
206. Steel-covered plates for public staircases that will not allow pedestrians to slip, and which will not lose their efficiency through ice freezing in grids.
207. A more effective bumper at the bottom of elevator shafts that will stop a car safely should it drop a reasonable distance. The present bumpers will not do this.
208. Inexpensive method of noise-conditioning. A great deal of fatigue and inefficiency in industry arises from effects of noise on the nervous system.
209. Method of casting glass without causing bubbles to be formed by the air.
210. A new foundry crucible made of some refractory material that will not break under excessive temperatures and mechanical abuse to which they are subjected.
211. A better heat-conducting brick for bakers' ovens. This will bring greater oven efficiency and faster baking.
212. There is still a need for a more efficient rail joint with complete solution of expansion and contraction, and of easy-laying problems.
213. Eliminating ice that forms on the surface of the water in troughs between railroad tracks that are used for taking water on the fly. No chemicals can be used on account of the damage they would cause to the boiler itself.
214. An automatic machine for polishing and buffing oddly shaped metal articles.
215. Way of preventing leakage in boiler tubes.
216. Way of making bricks of fuel from coal pile waste. This waste is ordinarily known as culm at the mines.

217. A dime-in-the-slot shoe shining machine that will not need the attention of an attendant.
218. Clothing for policemen and outdoor workers which will be self-heated through chemical or electrical means.
219. Way of making improved packing cases from wood, stronger, yet lighter.
220. A better method of protecting eggs against breakage in shipment.
221. A pneumatic cushion that will not have a rubber case. Rubber ages rapidly and therefore cushions of this type are not altogether practical. Cushions should also be leak-proof.
222. An attachment for typewriters which will count the number of words on a page and keep a running total.
223. A fountain pen that will manufacture its own ink by the introduction of water.
224. A non-inflammable, non-glossy collar that can be cleaned with a damp cloth.
225. Automatic machinery for the making of barrels.
226. Reduction of the number of parts in calculating machines.
227. An automatic stand for an electric iron that will function when the iron is not in use. The stand should be attached to the iron without adding any great weight.
228. Easily detached covers for canned jellies made for the retail trade.
229. An automatic egg-washing and sterilizing machine that will handle at least 100,000 eggs hourly.
230. A compound for making phonograph records that will be so hard that they will not wear out under constant reproduction. It should also eliminate surface noise.

- 231. Electric or other means of detecting underground streams of water.
- 232. A means of taking express packages from railroad trains without stopping the train. This would be of great value for saving of time at small stations.
- 233. Photographic plate that cannot be over-exposed.
- 234. An insulated rail joint more impervious to moisture than those now employed.
- 235. A cheaper way of producing pearls having the iridescence of the original article. There is at present a process used in France which makes use of the scales of a certain fish but this is too costly to give the artificial pearls a popular price. Other methods involving the culture of pearls require too long a time for growth.
- 236. A way of giving letters a wax seal without the use of sealing wax that has to be heated.
- 237. A way of preventing fires in the automatic match-producing machinery used in match factories.
- 238. Indestructible china ware for home use; addition of ingredients to the china or a new chemical compound might give break-proof qualities without increasing cost or altering appearance.
- 239. Self-aligning typewriter, so that letters will always be in perfect line.
- 240. Non-warping shingles.
- 241. A new method of making paper money which will make counterfeiting absolutely impossible. Counterfeiters today show such skill in steel engraving that some of their product is practically undetectable.
- 242. Improvements in oil-burning equipment in furnace attachments.

- 243. A buckle on knickerbockers that will not tear the cloth.
- 244. A substitute for nickel plating that will permit of more rapid work.
- 245. A fully automatic change maker for use on one-man street cars and busses.
- 246. A folding baby carriage that will be light in weight and easily portable.
- 247. Automatic transfer-vending machines for use on public transportation vehicles.
- 248. Substitute for the present erasers that will not destroy the surface of the paper.
- 249. A composition substitute for ivory piano keys that will not discolor.
- 250. An inexpensive process for the coating of paper giving it a glazed surface without the use of an expensive clay filler.
- 251. Large producers of foodstuffs use millions of eggs annually and some inventor should find a way of making a product out of the thousands of tons of egg shells made available.
- 252. A practical automatic coupler for use on passenger coaches. This would do much toward saving train time.
- 253. A vibration and noise-proof base for machinery.
- 254. An oil-burning device with a more simple automatic control.
- 255. A desk clock that will remind business men of appointments.
- 256. A new way of applying copper or metal surfaces rapidly without resorting to plating by the electrolytic method.
- 257. A better means of keeping sleeping pillows sanitary by internal ventilation.

- 258. A quick-drying library paste that will be waterproof.
- 259. Electric sign to be carried by airplanes that will not require excessive current to produce visible effects at high altitudes.
- 260. A reliable method of cutting trees with a wire heated electrically.
- 261. A method of taking advantage of the lubricating qualities of mica in the production of small oilless bearings.
- 262. A radio-phonograph so designed that the phonograph could be instantly removed from the cabinet and used as a portable phonograph.
- 263. The atmosphere of industrial cities contains tons of soot to the cubic mile. A condenser for factory chimneys would not only eliminate the nuisance angle, but would recapture valuable coal-tar products from which everything from perfumes to explosives are made.
- 264. A shutter for cameras that will be less intricate than the iris shutter now employed.
- 265. Electric floor washer that will scrub, rinse and wipe floors in one operation.
- 266. Rapid advertising transfers for glass that can be applied without danger of mishap.
- 267. A rapid fire non-exploding gun built on the centrifugal principle.
- 268. An automatic deodorant for toilets that really neutralizes odors instead of super-imposing one scent over another.
- 269. An eraser made especially for removing india ink from tracing cloth without damaging the fabric.
- 270. A device that will permit one man to handle a high pressure fire hose without danger.

- 271. A better telescoping fire tower than can be used for greater heights.
- 272. Bread mixer for bakers in which there will be no danger of accidents to the bakers.
- 273. A simple automatic bread wrapper for small bakeries.
- 274. An automatic cookie cutter and roller.
- 275. A wrinkle-proof cravat made from cheap fabrics, which will be shaped or designed to form a perfect knot without special skill.
- 276. Way of assembling cheaply made chairs so that the joints will not loosen or weaken through use.
- 277. Unbreakable doll heads of papier mâché.
- 278. A gummy liquid substance to be used instead of air in bicycle tires.
- 279. A noiseless cafeteria tray that will preserve a bright, polished appearance under hard service.
- 280. An artificial method of accelerating the seasoning of lumber.
- 281. A substitute for wooden paving bricks that will tend to produce more noiseless streets.
- 282. A cheap chemical preparation that will absolutely remove the scale from a boiler and prevent its formation.
- 283. A way of mounting diamonds in gold so that there will be no danger of the diamond cutting the metal and becoming loose.
- 284. A means of rewinding film on the pick-up reel of a motion picture machine so that it will be unnecessary to rewind it again for projection.
- 285. Shower bath valves that will indicate the temperature of the water.

286. A method of preventing strains in cheaply cast glassware. These strains cause breakage and great waste.
287. A radio so small that it can be included in a camera without increasing the weight appreciably.
288. Self-adjusting wrench for tightening small nuts.
289. A non-electric drip pan alarm for ice boxes.
290. An improved method of ventilating subways and tunnels.
291. Universal grinding machine for scissors, knives, lawn mowers, etc.
292. A patent layout for a garage that will facilitate the movement and storage of cars.
293. Improvements in artificial limbs that will make for comfort, lack of noise and sure-footedness.
294. A simple and semi-automatic ticket printer for use in stores. This should allow persons inexperienced in sign printing to produce fairly artistic effects.
295. Safety devices for powder factories that will prevent explosions.
296. A glove fastener of the snap-fastener type that will always stay caught except when manually opened.
297. Highly polished reflector for searchlights that will not tarnish with age.
298. An automatic measuring or classification process for granular materials in certain industries.
299. An automatic linotype that will work directly from copy prepared on a special typewriter, perhaps on the perforated ribbon principle.
300. A hotel can opener that will open the can and relieve it of its contents in a single operation.

301. A pressure kettle for cooking with a simple safety valve device, that will not be much greater in cost than ordinary vessels.
302. An all-metal vacuum bottle for lunches that will not break.
303. Leak-proof gas stove.
304. A light-weight envelope of some substance that would completely prevent folding or damage to contents in the mail.
305. Inexpensive way of producing a non-capsizable canoe without the use of expensive sponsons now employed.
306. Bottle stoppers that will absolutely prevent the entrance of air but which may be easily removed.
307. A combination electro-mechanical clock that will not stop when current goes off—operating mechanically when current is off, electrically at all other times.
308. Slate producers have a great deal of powdered slate and some use is needed for it.
309. A means of producing an animated drawing. A new and rapid system of creating cartoons for the production of moving pictures. The present method requires more than 10,000 drawings for a short feature.
310. Method of manufacturing or treating hard, gloss candies so that they will not be affected by changing atmospheric conditions. There should be special protection from humid atmosphere.
311. An adhesive that will act like rubber cement for wallpaper. This would permit easy and complete removal. It should not be expensive but may be more expensive than the adhesives now used.
312. An improvement in dump body motor trucks to be operated from the driver's seat and using engine power. The method should be more rapid than those at present employed.

313. In order to test the possibilities of steam power units of extra high pressure at the least possible cost, a small high pressure turbine should be installed in an existing power station which would reduce high-pressure steam to the ordinary pressure used in the plant and discharge it into the plant mains. Such an installation could be fed from a small high-pressure steam generator at low cost, and its performance record would give some idea of the advisability of spending money and effort in the further development of high-pressure units.—Prime Movers Committee, N.E.L.A.

314. A new automatic grease cup that will be absolutely positive in its operation and which will give some sort of an indication when it is empty.

315. A method of preserving cottage cheese so that it will be possible to transport it over long distances and to keep it a reasonable time in grocery stores before it deteriorates. At the present time it lasts only two or three days in hot weather.

316. Experience has indicated that the micro-structure of the metal in condenser tubes has a great influence upon the resistance of the tube to corrosion. It would be of great advantage to users of condenser tubes if some simple physical test could be applied to all tubes to indicate their fitness as regards micro-structure. An actual microscopic study takes too long and is too expensive.—N.E.L.A., Prime Movers Committee.

317. Improvements in button-molding machines to facilitate production and prevent wastage.

318. It has been found that compressed paper wheels are practical for use on railroads save that they flatten when they are permitted to stand over night. These wheels assure quiet, noiseless operation but they have this one disadvantage which might be overcome.

319. A method of salvaging waste lumber is wanted by the National Lumber Manufacturers' Association.

320. Process for making silver untarnishable.

321. A non-freezing railroad switch that cannot be made inoperative by clogged snow.

322. A safety razor with a blade guard so designed as to permit shaving in close quarters as in trimming mustaches.

323. Considerable improvement could be achieved in the accuracy and permanency of calibration of measuring instruments by the use of magnet steel of greater coercive force and spring materials having less elastic fatigue.—Bureau of Standards, Washington, D. C.

324. A method of producing simple and less expensive stencils for addressing machines used in large offices.

325. A new process for enameling electric wire. Something that will be less expensive and more rapid in operation will give this kind of wire a good sales impetus.

326. An automatic soda mixer and dispenser that will deliver a product of the desired flavor at the touch of a button.

327. A slot machine that will deliver ice cream cones.

328. An alarm device for overloaded bridges.

329. A portable typewriter with standard keyboard that will be one-half the size and that will have one-half the weight of the present machines.

330. A visible indicator for guns and revolvers that gives conspicuous warning when they are loaded.

331. A child's cart that can be easily converted into a wheelbarrow.

332. A method of changing the tone of a piano for different effects.

333. A better and less expensive method of binding books.

- 334. A system of communication between the engine and the caboose of a freight train.
- 335. A mouse trap that will destroy the body of the rodent.
- 336. A shotgun that will not kick.
- 337. A non-leaking fountain pen.
- 338. A pencil that will write in three different colors, yet of such simple design that it can be sold for a quarter.
- 339. A "daddy" doll would be as popular as a "mama" doll.
- 340. Better ventilation for the goggles worn by workmen.
- 341. A means of regulating the size of blow torch flames in such a way as to insure a uniform and pre-determined degree of heat.
- 342. A sled-type coaster with rollers that could be used in the summer time.
- 343. A cigarette package that can be opened by a single operation.
- 344. A tiny humidifier that can be carried in an ordinary tobacco can and that will not require too frequent moistening.
- 345. A less expensive system of vacuum packing.
- 346. A soldering iron that will never corrode.
- 347. A baby's crib that can be extended to accommodate growth.
- 348. A method of keeping deposits out of the pipes of hot water heating systems.
- 349. A self-starting blow torch.
- 350. A better tire spreader for use in tire shops.
- 351. A cheaper and lighter fish pole that will not break.

- 352. A pocket knife that can be opened more easily and without danger of breaking the finger nails, without a self-opening spring mechanism which is rather dangerous.
- 353. A novelty barometer that will tinkle with a gentle alarm upon indication of a weather change.
- 354. A fish hook that will hold and yet that can be more easily extracted.
- 355. A hand road marker that will go in a straight line once set.
- 356. A more efficient ankle supporter for skaters; one that will positively prevent turning of the ankle.
- 357. A little device to make realistic sounds for toy animals.
- 358. A carpet sweeper handle so arranged that the operator may reach under beds without bending.
- 359. A simple device to prevent bath tubs from overflowing.
- 360. An ash tray that will be absolutely free from odor.
- 361. A new post hole digger that will automatically discharge the loose dirt as it is turned and that will not have to be removed from the hole until the job is finished.
- 362. An adjustable ring for children that can be accommodated to the growth of fingers.
- 363. A new method of fastening shoes to skis to prevent broken legs and ankles during spills.
- 364. A device that can be attached to ordinary typewriters that will prevent noise.
- 365. A better and more accurate sight for bows would be welcomed by those who have taken up archery as a hobby.
- 366. An ice cream cone so designed that it will not drip over the edges.

367. A non-sagging gate for use on farms and large estates.
368. A picker for cherries so efficient that the operator can stand on the ground and clean a tree within an hour's time.
369. A simple apple washer for farmers. With the use of the poisonous lead compounds for spraying, apples cannot now be sent from one state to another without washing.
370. A small and simple little handle that can be carried in ladies' pocketbooks and that can be adapted to any parcel for easier carrying.
371. A method of fastening legs to grand pianos without the use of screws to permit easy removal when moving.
372. A better and more effective method of carrying lead fumes away from the lead pots of linotype machines.
373. A paper quart basket for berries and other fruit that will be water-proof and strong enough to withstand ordinary usage.
374. An exposure meter built into a camera that will automatically set the shutter speed and opening for each picture. The one on the market is not wholly satisfactory and is too costly.
375. An ice box that will defrost itself in a minute's time.
376. An attachment for the ordinary washing machine that will enable it to be used for washing silk stockings and other silk garments without harm.
377. A new and better way of opening sardine cans. One that will be faster and that will be less hazardous to the operator is needed.
378. Good optical sights for rifles are now worth at least \$10.00 each. There is needed a cheap sight that can be sold for \$2.00 or less that will do the work of the more expensive outfits.
379. Carbon paper or carbon paper substitute that will last three times as long as the present article.

380. All of the large mail order houses are looking for a method whereby envelopes can be stuffed by machine.
381. A new inter-locking brick that can be laid faster and that will form a stronger wall.
382. New playground equipment that will prevent accidents and yet that will entertain and amuse the children.
383. A new musical instrument that can be played within a half hour's time by one without musical education.
384. A bag for grocery store and other uses that can be held closed without adhesive tape and without string.
385. There are still many country sections of the United States that are not serviced with electric current. A steam flat iron supplied with a flexible tube and operating from a small boiler on the stove would save many steps.
386. A simple fountain type of floor oiler that can be adjusted between wide limits.
387. A lubrication system for factory use whereby the oil can be carried to all points in a single operation and from a central point.
388. A hand machine for applying adhesive tape directly to the package in large shipping rooms.
389. A smoking pipe scraper or bowl cleaner that can be adjusted to the bowl of any pipe and that will permit cleaning in a single operation. It should also clean the bottom of the bowl, where present gadgets fail.
390. A method of locking the top of bushel baskets in place so that the contents cannot be pilfered during shipment.
391. The present zipper is a big seller and has made a great deal of money for its inventor. It would be a bigger seller if it were made impossible to catch the flesh and pinch it.

392. Beginners in golf would appreciate a club that could be heavily abused without danger of breaking.
393. A safety device in a bathing suit small enough to prevent interference with swimming and yet effective enough to prevent sinking.
394. A new and more effective method of attaching the heels to high-heeled evening slippers.
395. A new and better method of holding tile to bathroom walls.
396. A two-furrow plow that will work as easily as a single furrow plow.
397. A harmless Fourth of July pistol that will make a noise as loud as that produced by a thirty-two calibre revolver.
398. Department stores, furnishing stores and rug dealers are looking for an improved rack to hold rugs and carpets so that they can be displayed more effectively and with less trouble.
399. An inexpensive rug washer for home use. The present machines cost \$300.00. One that could be sold for the price of a vacuum cleaner would be very popular.
400. A means of keeping the sediment out of a tea kettle. Either a chemical or mechanical system can be used.
401. The inventor who can produce cheap non-breakable dishes for restaurant use will become a millionaire almost overnight. The material need not be china but should be equal in appearance to good quality dishes.
402. An aisle seat for theaters that will be safe, cheap and very easily installed and removed to permit passage.
403. An eaves-trough that cannot be plugged with fallen leaves.
404. Many parents will not permit their children to ride on merry-go-rounds because of the possibility of accident. Therefore, an accident-proof merry-go-round is needed.

405. A truly efficient slug detector for slot machines and subway turnstiles.
406. A hairpin that will not fall out and yet may be removed without pulling the hair.
407. Hair curlers that will not catch and pull the hair when they are removed.
408. Athletes have long been looking for a supporter that will be properly ventilated.
409. Ordinary cheap bathroom scales cannot be used for weighing anything to be sold because they are inaccurate and therefore illegal. A cheap and accurate scale is needed.
410. A key holder for pocket use that will bring forth the right key without searching.
411. A means of tuning pianos at home without professional aid.
412. A mop worked on a vacuum principle so that wringing will not be necessary.
413. A catsup dispenser that will not jam and that will be sanitary at all times. This is especially needed for restaurants.
414. A bag rack for grocery stores that will open the bag and make it ready to receive its contents as it is taken from the rack.
415. A kitchen table and ironing board combined would be a winner if it were not too complicated.
416. A non-rattling window screen and also a screen that can be adjusted in two dimensions so that it can be made to fit any window.
417. Men are constantly losing the buttons on their shirt collars and this is rather embarrassing when it happens during the day at the office. What is needed is a method of overcoming the use of buttons in any form for this purpose.

418. An attachment is needed for a lawn mower so that it can be used more efficiently in cutting the grass around flower beds.
419. A cheap little pressed metal gadget that can be used to hold steel wool used for kitchen purposes. The present method of holding the wool with the fingers is hard on delicate hands.
420. An inexpensive kitchen device for cleaning lettuce and removing sand from spinach.
421. A little device that will automatically measure prescribed quantities of butter in ounces or fractions of an ounce.
422. A method of putting ordinary wooden chairs together which will eliminate gluing.
423. If an inventor could design some sort of a tri-ice-cycle that could be propelled with pedals on ice, he would find a very enthusiastic market for his idea and his bank account would grow by leaps and bounds.
424. A little device or a method of manufacture that will prevent sole rubbers from slipping off at the heel would be greatly appreciated by people who use such footwear.
425. A garbage can with a lid that would be safe against marauding dogs of the large size would be welcomed by housewives. Present locking systems are too cumbersome.
426. A still cheaper way of making polaroid glass or celluloid.
427. An alarm clock with an adjustment so that the racket made could be controlled to meet the demands of the sleeper.
428. A hinge for plastic box containers that will not need to be riveted.
429. A folding tricycle that could be taken on trips for the convenience of little Willie would win tidy sums of money for its inventor.

430. A combination salt and pepper shaker for the housewife. The device could be controlled by a button. When the button was pressed salt would come forth and when the button was left in position, pepper would be available.
431. An all-metal kitchen paring knife that would be comfortable to use. No wood should be used and only a single piece of metal employed in the construction of the article.
432. A new means of fastening a necklace that will prevent loss. The small, delicate catches used today are not practical and many very valuable pieces of jewelry have been lost through their failure.
433. A bed spring that could be sold with a guarantee against squeaking would be sought by several million light sleepers.
434. There is a great need for a bed spring in which defective spring units might easily be replaced.
435. A better method of affixing solid rubber tires to baby carriage wheels.
436. A door hinge so designed that it would be possible to suspend a door on two ball bearings.
437. The erasers on the ends of lead pencils usually wear out before the pencil itself has been used up and for this reason a pencil equipped with a larger rubber that can be fed out as it wears away has distinct commercial possibilities.
438. There is a need for a fountain pen that will register the amount of ink in it without the pen's being transparent.
439. The rollers on children's roller skates wear out quickly and hence there is needed a skate so designed that the rollers can be easily interchanged.
440. A simple and inexpensive letter sealer for the office that could be sold for \$3.00 and that would seal at least 3,000 envelopes per hour.

441. A simple little gadget that the housewife can use to efficiently skim the grease off the top of hot soup would be a ready seller.
442. A captive ball for golf practice that would register the impact in yards would help amateurs.
443. An ammunition belt for machine guns that will be cheap enough to be thrown away after being used.
444. A means by which the essence of tea or coffee can be crystallized so that it can be readily dissolved in hot water.
445. An automatic top for ink bottles that will open when the pen is inserted and close when it is withdrawn. It should be made in such a way as to be adaptable to any ink bottle regardless of the size of its neck and it should be cheap enough to be sold in the chain stores.
446. There would be wide use for a pencil that would write black rather than gray, as is the case with our present so-called "black" pencils.
447. A safety razor so designed that its blades will not have to be taken out and wiped off after they are used.
448. A wrist watch bracelet that will not have a tendency to slip out of position. Here would be one of the biggest money-makers imaginable.
449. A more sanitary bird cage could catch the eye of several million housewives who like to keep birds for pets.
450. There is also needed a bird cage that will prevent accidents to birds. With the present cages many birds are killed by hanging.
451. A camera whose shutter could not be operated until a fresh film was wound into position would save a great deal of film and many later disappointments as well.

452. A sod-cutting tool for the garden that will cut one square foot at a time.
453. Some sort of a blotting device that could be carried on a fountain pen would be popular and profitable.
454. A pocket nail clip that will leave a smooth edge on the finger nail and eliminate the need for filing.
455. A bathing cap that will not leak and yet that will not fit so tightly as to cause headache.
456. An attachment that will permit the amateur photographer to take panoramic views with an ordinary camera.
457. A device that tailors could use to cut new nap on shiny trousers would solve one of the most vexing problems of the well-dressed man.
458. An attachment for a gas stove that will prevent windows from steaming while the stove burners are in operation.
459. Every hot air furnace is provided with a water pan to humidify the air passing through the furnace. Since most people forget to keep this pan full of water, a simple automatic filling system is needed.
460. An inner sole for slippers of porous, flexible material which will permit the slippers to be worn on bare feet without causing the sole to curl up and crack.
461. A cheap emergency raincoat that can be sold for from ten to twenty-five cents would be a most useful article on wet days.
462. A wind-proof cigarette lighter of the flat type. Round lighters have been manufactured with this feature but these articles are not adaptable for pocket use.
463. The corkscrews in use at the present time chew a cork to pieces during removal and a really new and revolutionary system is needed.

464. A valve or dial on a bath tub that would permit the bather to regulate the water to any temperature before it was turned on.
465. A fortune still awaits the fellow clever enough to invent a beer bottle cap that can be removed with the fingers alone, yet will keep the contents perfectly air-tight.
466. We have many wonderful inventions in the world today but we still need a little salt shaker that will keep its contents free from moisture.
467. A shoe polish can that can be opened easily and with positive protection against soiling the fingers would be a big ticket indeed.
468. A scale for shops that will automatically tell the customer the charge to be made.
469. A cake pan or tin that will be proof against shock while a cake is baking in the oven.
470. A simple attachment for a vacuum cleaner that would be sanitary and that would direct a stream of clean, warm air for use in drying hair would be snapped up by cleaner manufacturers.
471. A wind-proof window awning would meet with very large sales for the entire life of the patent if it could be sold at low cost.
472. A cork for medicine bottles that will automatically measure out one drop at a time.
473. A method of utilizing fly ash recovered in power generating stations for industrial purposes.
474. A waterproof padlock that will neither rust nor corrode will find wide use out-of-doors.
475. A cork for an ink bottle that will prevent stained fingers would be snapped up at a very high price.

476. Pipe smokers would go in a big way for a chemical filter inserted in the stem which would really cool the smoke and minimize the lip and mouth troubles which physicians trace to hot pipe stems.
477. An attachment for an ordinary gas stove that will prevent the loss of heat by dissipation. When a pot is placed over the gas flames on the present-day stoves much of the heat applied escapes into the surrounding atmosphere.
478. A toy bank that would correctly tally all deposits made in coins of various denominations would add an incentive to saving for children.
479. A dripless pitcher lip that will not appear freakish and that can be made without additional expense will make a great deal of money for its inventor.
480. Due to the fact that rubber heels are not worn down evenly we need inter-changeable heels so that wear may be evenly distributed.
481. Lawn mowers are stalled when bits of wood and stone get in between the blades and the knife. Some method of keeping these obstructions out of the mower is needed and needed badly.
482. A little device that would permit boiled eggs to be peeled without burning the fingers would meet with the approval of several million housewives.
483. A small pot-cleaning tool that could be sold for ten cents and that would replace the unsanitary steel wool now used for such work would be extremely popular.
484. A bathing suit with a waterproof pocket that would hold paper money and other valuables without danger of loss.
485. A large fortune awaits the inventor of a pair of spectacles that will stay put and whose frames will never need to be adjusted once fitted.

486. A phonograph needle that will wear forever and that will not damage the new high-fidelity records.
487. There is always a certain amount of danger to the fingers in food choppers that have to be fed by hand and there is needed a self-feeding food chopper.
488. An orange peeler for the home and restaurant would be a very acceptable article, especially if it were cheap.
489. Putty is a most unsatisfactory method of sealing a window pane and a combination of steel and rubber is badly needed.
490. A furnace grate that will crush large clinkers would bring a tidy sum to its inventor.
491. Method of treating corks cheaply so that highly volatile liquids cannot evaporate through them.
492. New and more humane animal traps will win the easy approval of the conservationists. Prizes for such traps are frequently offered by humane societies.
493. A simple little attachment on typewriters that will re-ink the ribbon as it is used would be an easy money maker.
494. A roof composition which will remain permanently leak-proof and need no attention for the life of the building is still badly needed.
495. A camera support that will eliminate the use of the clumsy tripod.
496. An improved ear-ring that will not pinch the ear and yet that will not fall off.
497. Piston rings in gasoline motors wear rapidly, losing compression and power in the cylinder. A piston ring substitute which would last the life of the car would save millions of dollars in repair bills.

498. A simple gauge that would tell the hunter and the marksman the speed of the wind would help to bag game and to hit bull's-eyes.
499. A clothes-line tightener that will keep the line tight regardless of the weight of the clothes placed on it.
500. A tricycle for children that could be changed over into a bicycle as age increased.
501. Some automatic method of keeping the two parts of a pair of scissors pressed tightly together for maximum cutting efficiency.
502. A pill bottle top so made as to permit the passage of but a single pill at a time.
503. An improved method of fastening a door knob to its shaft.
504. A safety razor that has a band of sharpened blades rolled within it and so arranged that a new blade can be pulled into place when the old one is broken off and thrown away.
505. Those who sleep with their windows wide open in the winter time would appreciate some method of operating the window from the bedside.
506. A pitcher so arranged that a can of evaporated milk could be placed inside and punctured for use at the same time. The can should not be visible once it is placed inside the holder.
507. Permanently installed ash receivers for bars and public places that will automatically destroy cigar and cigarette butts so that they can be carried away to the sewer.
508. A public penny-in-the-slot scale that will give the customer his height as well as his weight would be popular and useful, especially in the case of growing children. Complete information should be divulged automatically by the machine in the form of a printed card, without need for any manipulation by the customer.

509. A pocket-sized white shoe cleaner in the form of a pad would be bought in large numbers by women and men alike.

510. A mechanically-operated ice chopper for sidewalks would be purchased by hundreds of shop owners on the important streets of large cities.

511. A cheap and efficient vegetable slicer that can be sold in the chain stores at a price well under a dollar.

512. Men are always ready and willing to buy new and improved safety razor blade sharpeners if they look good. There is as yet no really efficient sharpener on the market for personal use.

513. A window lock that will function automatically when a window is closed. The present locks require hand adjustment and the householder is very apt to forget to fasten windows.

514. If a coaster brake so cheap that it could be applied to children's tricycles could be developed, it would meet with wide use.

515. Good leather is costly and present cheap substitutes not satisfactory. What is needed is a composition as durable as leather, as flexible and even more impervious to the elements than the real product.

516. A bread knife that will cut a slice of pre-determined thickness.

517. A sanitary soap holder that would permit the water from soap to drip into the basin and that would not grip the soap so tightly that it would gouge it would be a happy solution for a constant problem of the bathroom.

518. A baby carriage with wheels that can be easily replaced with runners for snow would be a quick seller, especially if it were not necessary to remove the wheels in the change-over.

519. A simple and invisible device that could be placed underneath a tie to keep the ends of soft collars pulled together would be a fast seller in men's furnishing shops.

520. A method of holding carpets to stairways without the use of tacks or rods or anything to deface woodwork would make money now that such carpets are back in vogue.

521. A self-wringing mop that could be twisted dry without bending over would make mopping a trifle more popular with housekeepers.

522. Plates as made at present are uncomfortable to the user and cannot be held firmly in place. A solution to this problem would revolutionize the practice of dentistry.

523. A little attachment for a child's tricycle that would provide a noise like a motorcycle would quickly win its place in the toy world.

524. Hotels are in need of an article that will quickly and efficiently peel bananas.

525. The field of metallurgy offers innumerable opportunities to the inventor. Practically any article made of metal is crying for improvement.

526. Several million toothbrushes are used in the United States annually and there is needed a new form of tooth cleaning device that can be screwed to the top of a toothpaste tube so that the paste can be fed to the cleaning device directly from the tube.

527. A mechanism that would prevent the accumulation of dirt and foreign matter in the bottoms of automobile gas tanks would be a boon to the automobile industry.

528. Picture-framing material that can be sold by the foot in the chain stores and that can be applied by any unskilled person.

529. A small and inexpensive check protector that could be bought and used by the American family would be bound to roll a fortune up for its lucky inventor. It should do as clean a job as the large office machines.

530. Many older men with poor circulation in their legs cannot wear garters and a new method of holding socks in place is needed.

531. A device that will either quickly repair a flat trolley wheel or prevent one will save a great deal of racket in large cities.

532. A method of joining the seams of gloves without the use of threads.

533. If we had an inventor who was clever enough, there is no reason why housewives could not be provided with adjustable cake pans so that it would not be necessary to have several sets about the pantry.

534. Shaving soap with harmless ingredient that will prevent the rusting and dulling of blades between shaves.

535. The really wind-proof clothes pin would not only save a great deal of work on the part of housewives but it would be bought by them in tremendous quantities.

536. Long stretches of stove pipe now have to be wired to the ceilings of houses. A method of supporting such pipes that would be invisible would sell very fast. It would have to be inexpensive.

537. A simple kitchen device that would cut the kernels from corn cobs at a high rate of speed would sell in great numbers through the chain stores.

538. Coffee pot handles become unbearably hot and are gradually charred away when such pots are boiled over open gas stove flames. A simple detachable handle would prevent this inconvenience and damage.

539. A simple expanding metal gate that could be quickly installed in any doorway regardless of its width would find a big market with people who have children.

540. Business men would buy a holder for French 'phones that would permit them to write and use both hands while they were talking.

541. An automatic self-measuring flour sifter would speed up the work of baking and would win the approval of many thousand housewives.

542. A sled of the flexible flyer type that would permit the turning of sharp corners would quickly win the hearts of boys.

543. A new method of power for toy trains, automobiles and airplanes would make millions in royalties for the lucky inventor who could turn the trick.

544. A new inter-locking system of wooden blocks would be quick to win the approval of parents buying such toys for their children.

545. A method of making hollow steel building blocks for children would be of great commercial value.

546. A machine gun that would fire wooden slugs from a cartridge belt would be a winner for boys who like to play with war toys.

547. A toy submarine that could be sold for a dollar retail and that would dive under the water automatically would make a quick fortune for its creator.

548. A fool-proof and kick-proof method of keeping the covers on small children while they sleep would find its way into millions of homes throughout the country.

549. An attachment for a shaving cream tube that would permit the user to spread cream of the brushless type in an even layer, directly from the tube.

550. A cheap window ventilator that will keep out rain, insects and dust.

- 551. A clothes hanger that will preserve the shape of all kinds of garments.
- 552. A simple method of making a sheet metal spool for adhesive tape that will permit the tape to be cut off cleanly.
- 553. A handle for an electric flat iron that will remain cool would be popular with housewives.
- 554. A ten-cent article that would permit the opening of fruit jars by people of ordinary strength, especially women.
- 555. A new method of sealing and opening canned beer.
- 556. New forms of window attractions for shops.
- 557. An electric sign of the ordinary type that will have the same visibility as neon.
- 558. A non-tipping ink bottle.
- 559. A new and better method of keeping swimming pools sanitary.
- 560. An anti-skid device for shoes that will be invisible and that will effectively prevent slipping on ice.
- 561. Playing cards that will never soil or that can be washed when soiled. They should not be expensive, which is the handicap of present cards of this type.
- 562. A little machine that will deal playing cards automatically. The present machines are not satisfactory.
- 563. A man's garter that can be cleaned.
- 564. A freight car coupler that will not pull out regardless of load.
- 565. An unbreakable ball bat.
- 566. A ventilated ball glove that will not become uncomfortably warm.

- 567. A painting machine for large flat surfaces that will be automatic in operation, adjustable to desired thickness of coverage.
- 568. Library paste that will not become rancid.
- 569. An indestructible ping-pong or table-tennis ball.
- 570. Basketballs and footballs that will not leak air. The same principle could be applied to auto tires.
- 571. An indestructible dental burr. At present these must be frequently replaced or reground.
- 572. A really humane dog muzzle that will permit the animal to eat without entire removal of the muzzle.
- 573. A system for speeding up the ripening of oranges after they have been picked.
- 574. A baseball made without seams.
- 575. A simple system of locker key duplication that can be used without the necessity of sending to the manufacturer of the locks.
- 576. A method of opening large vaults from the inside to overcome the danger of time locks and threat of suffocation.
- 577. A smoking pipe that does not have to be broken in either by the smoker or the manufacturer.
- 578. A cheap, accurate thermometer that can be sold in the five and ten cent stores. The present instruments of this inexpensive type are very poor.
- 579. A method of using rubber or other sound-absorbing mountings on subway trains to prevent noise.
- 580. Disappearing guard rail for subway platforms.
- 581. A window cleaner working from the inside for high office buildings.

- 582. Children's shoes with indestructible toes.
- 583. A method of eliminating saliva in wind instruments.
- 584. A drum that will not be affected by atmospheric changes.
- 585. A simple method of color photography satisfactory for the inexpert amateur that will enable him to make cheap color prints on paper in his own darkroom.
- 586. Adjustable school desks that cannot be tampered with by students.
- 587. A package-wrapping machine for use in department stores.
- 588. A noiseless toilet that will not be as large as those in use today.
- 589. An unbreakable violin string.
- 590. A method of producing duplicate copies on a typewriter which will have exactly the same appearance as the original ribbon-printed copy.
- 591. A method of packing chocolates to keep them fresh and immune from melting in hot weather.
- 592. A really water-proof toothbrush bristle that will remain hard during the life of a brush.
- 593. A new type of garage door that will always work easily, never get out of adjustment, never drag and never freeze.
- 594. A method of eliminating the use of felt in pianos.
- 595. The makers of wall board are now looking for a method of holding thin sheet metal or foil to the surface of the various compositions used for this purpose.
- 596. An oil can that will deliver oil to the spout at the first pressure applied to the bottom.

- 597. A kitchen drain with a water-driven unit or wheel in it so that the fluid passing down will turn it and thereby keep sediment from forming.
- 598. A method of preventing store windows from frosting without the use of an electric fan.
- 599. A means of preventing offset in small printing presses.
- 600. The United States Government Bureau of Printing and Engraving is looking for a better method of accurately perforating postage stamps.
- 601. An air rifle that will be as powerful as a twenty-two calibre rifle.
- 602. An indoor target that will stop high-powered bullets and that will never wear out.
- 603.* A pistol and machine gun that will never jam.
- 604. A method of disposing of household garbage.
- 605. A safety match box that must be closed before the match can be struck.
- 606. A simplified method of washing cars at home.
- 607. A method of heating concrete forms in winter construction.
- 608. A new unbreakable and collapsible ruler.
- 609. A more foolproof method of glass-cutting better adapted to employment by amateurs.
- 610. A method of keeping ice off the sidewalks in the front of business houses.
- 611. A cigarette case that will keep the tobacco fresh for an indefinite period of time.

612. An all-around drafting tool by means of which a draftsman may produce a creditable piece of work without the ordinary kit.
613. Shears which may be used to prune any fruit tree while the operator is standing on the ground.
614. A new and attractive method of arranging matches for the living room. The last thing to make a big hit happened to be the flower-pot packets. Women are always looking for some unusual treatment of the match problem.
615. A device that will stop automatic presses in case of failing ink supply.
616. Paper that will not be affected by moisture.
617. A device that will prevent paper from jamming in newspaper presses.
618. An automatic newspaper vending machine that will be efficient and quick enough to be used by large city newspapers.
619. A garbage truck without odor. The health departments of all of the large American cities would force the use of such equipment.
620. Magnetic building blocks for children.
621. An erasing key on a typewriter.
622. A method of finishing the parts of a gas stove that becomes heated so that they will never discolor.
623. A new material to pack pillows and mattresses that can be discarded yearly because of its cheapness.
624. A simple machine or tool that will speed up the laying of hardwood floors.
625. Stamp dealers are looking for a little machine with which stamps might be hinged for mounting in albums. It would help them with their approval sheets.

626. Shaving soap that can be sprayed on the face.
627. A candle or a candle holder that will positively prevent dripping.
628. A nutmeg grinder that will not bark or scratch the fingers.
629. A glass bottle that cannot be re-used. The bottle does not have to be non-refillable. It should be rendered useless in the operation of opening. Liquor dealers would welcome such a design.
630. A non-freezing fire hydrant that will not cause trouble or require attention during the very cold northern winters.
631. A metal spring board that will not break and that can be adjusted for diving.
632. A new method of packing breakfast food to prevent the entrance of moisture.
633. An odorless gas stove with a low retail price.
634. Development of small Diesel engines suitable for automobiles is hampered by lack of a suitable fuel injection device and by the problem of excessive weight.
635. A better and less awkward guard for circular saws.
636. Ear-laps that will remain fixed to the ears without the use of steel bands.
637. A toy gun that will be harmless yet supply a very loud report when the trigger is pulled.
638. Stuffing for baseball gloves that will retain its shape and will not pack.
639. A paint brush that will prevent paint from accumulating in the shank and drying there.
640. A dry-cleaner's identification tag that will remain firmly fixed to garments during the cleaning process, but which can

easily be removed by the customer without breaking fingernails or using tools.

641. A strike plate for doorlocks that can be adjusted to compensate for change in door through drying out.

642. An awning that will rise or roll itself up automatically through spring action when a high wind comes up.

643. A means of observing the interior of electric and gas range ovens without opening the door. Glass doors have not proved entirely practical.

644. A means of fabricating a downy cushion for use on furniture so that contents will not bunch and shift.

645. Even with electric refrigerators there is still a need for a reliable icebox deodorant.

646. A pocketbook that will emit an audible signal when dropped, to prevent loss.

647. Lid for paint cans, absolutely air tight yet easy to remove and replace.

648. A cheap watch made in such a way that the tick cannot be heard.

649. A mechanical kitchen device that will peel or skin a tomato quickly.

650. A non-metallic draftsman's scale that will never warp.

651. A carpet-sweeper of the mechanical friction type that will lift dirt into a paper bag that can be burned.

652. A quick coin-tester for use by small merchants and retailers.

653. A key and lock that can be readjusted from time to time when it is desirable to change the combination.

654. A method of making desks and large pieces of furniture so that they can be dis-assembled more easily for moving.

655. An all-metal screen door and an appropriate method of fitting it.

656. A concealed ball-bearing roller in the legs of heavy furniture.

657. A tobacco pipe with interchangeable bowl liners which can be discarded when they become strong and that will in no way change the taste of the tobacco.

658. A rat tail for a file that will permit handles to remain in place more solidly.

659. A revolutionary method of attaching roller and ice skates to ordinary shoes.

660. A safety razor design that will permit the blade edge to be wiped off without removing the blade.

661. An invisible door check that can be mounted in the door jamb.

662. A tire valve for automobiles that can be guaranteed against leakage.

663. Housewives yearn for a container that will serve pancake syrup and similar liquids without dripping.

664. A method of making ink bottles so that only a small amount of ink, or none at all, will spill when overturned.

665. A plug or leak stopper which can be quickly applied to a water pipe by an inexperienced person.

Electrical

1. The various transformations that the energy from coal has to pass through before it is available for use in the electric socket or at the electric switch cause much of it to be lost. If the burning of coal could be made to produce electricity directly instead of producing electricity through the medium of steam, more would be saved and our coal supply would be greatly conserved. Edison did some work on this problem years ago and several other experimenters have contributed ideas but nothing practical has come of them. Edison constructed a sort of heated primary battery in which carbon or coal was consumed in the generation of electricity. Carbon, of which coal is largely composed, is the most abundant substance on the earth, and if its combustion can be used directly in the production of electricity, the idea will be worth many millions of dollars and it will make its inventor immortal.

2. The selenium cell is a device which changes its electrical resistance upon exposure to light. Its resistance falls, but not rapidly. If selenium cells could be prepared so the resistance would fall rapidly, these devices could be used in the electrical transmission of pictures over wires and by radio. The problem seems to be one of properly annealing selenium. A great deal of literature will be found in the public libraries covering selenium cells.

3. A vacuum cleaner is needed in which a powerful suction can be brought about that will not endanger the texture of the carpet

NOTE: Inventions marked with an asterisk (*) are of especial military importance.

being cleaned but which will be able to pick up threads and lint instantly without the use of a rotary brush attachment.

4. The electric light in use today rarely has an efficiency above 8%; 92% or more of the electrical energy fed to electric lights is dissipated in the form of useless heat. It is doubtful if the heated filament-type of lamp can be made much more efficient as a light giver than it is today. Hope seems to lie in finding a gaseous combination that will become highly incandescent when a suitable current is caused to flow through it in a glass container. If the mechanism and chemical constitution of the firefly could be reproduced exactly, this problem might be solved. However, the problem of the firefly is such a delicate one involving the art of the highly specialized biologist and the chemico-physico reactions are so involved that there is little hope for the average inventor who attacks the problem of more efficient light from this angle. Even small libraries are filled with information on electric lighting and the possibilities of cold light.

5. The electrically inclined inventor will find much to occupy his mind and genius in the field of electrical burglar protection. The burglar alarms now used in stores, banks, etc., are unsatisfactory in many ways and not altogether burglar-proof or fool-proof. Many of them are too sensitive to disturbance and consequently they often give alarm when there is no real cause, disturbing the neighbors, the police and the owners of the institutions where the alarms are employed. A burglar alarm is needed that will be sensitive and yet rugged so that there will be no danger of its giving alarm through some minor cause.

6. The electric arc can be made into a more efficient light giver by combining with the carbon electrodes a chemical preparation that will bring about greater illuminative power. Elmer Sperry placed some of the rare earths in the core of the carbons of his great searchlights and brought about wonderful results. No doubt some cheaper material can be found that will serve

the same purpose. Improvements are also needed in the automatic regulating mechanism employed in arc lights.

7. Reflectors that are cheap to manufacture and that will direct the light in any desired fashion, diffused or concentrated, are needed. A cheap way of making highly efficient reflectors without the use of glass or silvering would be a desirable improvement.

8. Advertising has made the electric sign so valuable that methods that make for greater efficiency and new effects are needed. The controlling apparatus, that is, the revolving contacts can also be improved upon and every inventor desiring to go into the literature on this subject will find much to occupy his attention. Startling new effects are most needed.

9. Annunciators are not infallible and improvements are needed that will produce an annunciator that will be absolutely positive in its operation. It should, of course, be assembled as cheaply as possible and should not cost any more than the annunciators in use today.

10. A short-circuit-proof electric socket is needed as well as a properly ventilated socket that will not become unduly heated when used in connection with nitrogen-filled lamps which become very hot at the base, often causing electrical trouble in the sockets they are used with. Some means of dissipating this heat is needed.

11. A simple form of conduit wiring that will not require the use of pipe-threading tools would find many interested manufacturers. An entirely new system must be worked out. The metal containers for the wire used should be universal and as interchangeable as possible. The metal should also be light and inexpensive.

12. An unbreakable electric bulb.

13.* The storage battery of today is too heavy for the amount of power that it is able to develop. That is, the ratio unit of

weight to power is great. If a man could produce, for instance, a storage battery so small that it could be carried in the hand and in which could be stored as much as 100 horsepower of electrical energy, transportation would be revolutionized. Electrical automobiles would gradually and surely push the gas-driven device from the field of competition. Even airplanes could be electrically driven. The writer regards this as one of the outstanding problems of the present age.

14. More sensitive and more accurate electrical measuring instruments are needed. The suspension of the moving elements of electric meters is the chief problem and one which needs most attention from inventively-inclined men. Means of rapidly calibrating meters individually on a scale that will make it commercially practical would be a vast improvement to this kind of manufacture.

15. High tension electrical insulators have given both electrical and ceramic engineers a great deal of difficulty. Some fusible substance or combination of clays or other materials that will produce a weather-proof, flash-over-proof and general leak-proof insulation with sufficient mechanical strength to withstand the strains imposed upon it by heavy transmission lines will make a vast fortune for its inventor.

16. A simple combination electric lock that will be thief-proof would find a ready market.

17. Electricity has not been entirely successful on phonographs because of the fluctuations in speed that would be brought about by the use of other electrical devices in the house at the same time. The problem seems to lie in the use of a suitable governor that will keep the speed of the disc at a perfectly uniform rate regardless of any small differences in the speed of the motor.

18. An electric duplicating typewriter operated by a master record in which duplicate letters could be produced cheaply and abundantly exactly the same as those produced by hand, is

needed. There is such a device in use today but it is a rather expensive installation and this has greatly interfered with its success. There are still plenty of improvements here for the inventor to work upon.

19. Switches used in connection with heavy motors often become burned after some use through the formation of arcs when the switch is opened. If it is not opened quickly by an experienced person, a disastrous spark or arc will be formed between the blades and the contacts. Some simple little device that will extinguish this arc or prevent its formation entirely is a needed electrical invention.

20. An electrically-operated polisher for automobiles would find wide use in the better class of garages where cars are on a service charge. The polisher should be used when applying some of the modern preparations that require a great deal of hard work. The polisher should be able to reach every corner of the car and should be able to adapt itself to the various contours of the body.

21. One of the problems of electric motor construction is that of producing suitable ventilation—that is, keeping a stream of fresh cool air pouring through the winding of the device. A cool running motor is an efficiently running motor, and hence the problem is important. Perhaps the field and armature of a motor could be so constructed as to allow air to pass through in such a way as to bring about a cooling effect. Of course, a fan can be attached to the motor shaft to produce the stream of air.

22. Signal wires on telegraph poles have a habit of heating and expanding under temperature changes and this combined with the weight of sleet and ice often causes them to break. Some kind of a wire compensator that will take up the slack or hold the wire at a normal degree of tautness at all times and under all conditions will prevent many interruptions in telegraphic and telephone service and will be of inestimable value to the larger communication companies.

23. The production of suitable apparatus for the amplification of sound for deaf persons still remains a problem, although there are numerous devices on the market which are offered for this purpose. A small, faithful reproducer of sound that will be as inconspicuous as possible is needed. Recent research has shown that the sound sensitive organs of human beings are more dead to some frequencies than to others and it would seem that a reproducer must be designed in such a way that these frequencies will be amplified to an extent where normal hearing is again made possible.

24. Some sort of a simple electric signal to be placed at street intersections to warn approaching traffic on the lesser used thoroughfares would avoid many accidents that occur at blind corners.

25. A rechargeable dry battery in which the more expensive elements can be saved is needed. When dry batteries become exhausted only certain elements are exhausted. The carbon pole, the terminals and the wax remain absolutely unharmed and could be used over and over again if some method of restoring the active element could be devised. Various attempts have been made but they have been unsuccessful from the commercial standpoint. This refers to dry batteries. With wet batteries it is an easy matter to bring this result about. Such a plan would reduce the cost of dry cells and would bring to its inventor a very comfortable estate.

26. Electrically-operated hammers for small forging machines would be a distinct improvement over the methods now used, and although several manufacturers have made attempts to solve the problem, it still remains in the electrical field waiting for the necessary touch of genius that will bring it out into the work-a-day world ready for service in the numerous forge shops throughout the country.

27. Telegraph poles would remain practically indestructible were it not for the rotting action that takes place in that portion

of the pole covered by the earth. Here a severe chemical action brought about by the ingredients of the earth sets in and the wood rapidly succumbs until the pole falls easy victim to any unusual wind storm. Various substances have been used to impregnate these pole butts but none of them has proven efficient enough to make the butt of the pole last as long as the upper portion.

28. Along this line there is also need for a cheaply-constructed concrete pole that will not easily disintegrate or crack. Such a thing should be constructed, if possible, without the use of a steel core. If steel is used at all it should be in the form of a fairly light screen or gauze.

29. A moderately-priced motor- or magnet-driven razor sharpener that could be attached to the bathroom wall would be purchased by many men who do not care to go to the trouble of sharpening their blades by hand. This is a comparatively easy problem that anyone with a modest knowledge of electricity should be able to solve.

30. An unbreakable case for telephone receivers that will withstand the abuses of intense usage would be welcomed by the telephone manufacturers. It should be a moulded affair similar to those in use, but able to withstand the many knocks that finally ruin the present receivers.

31. A substantial electric terminal that will take the place of the screw terminals of today will find a ready market. This device should offer substantial contact of low resistance and yet should be easily released or attached to the wire by a simple movement.

32. There is a need for a simple arc electric furnace that will bring about a high heat in a space practically devoid of air. This could be used in special chemical and metallurgical processes, and while it may not bring fabulous wealth to its inventor it would at least bring a very substantial return.

33. There is a need for more efficient electroplating processes of all kinds. These problems usually resolve down to the matter of producing the proper chemical solutions for the electroplating cells.

34.* A gun operated by electromagnetic influence able to project a shell at high speed without the use of known explosives would be of interest to the government. While some work has been done along these lines all the large guns produced so far have been of such a nature as to demand great quantities of current which makes it almost impossible to operate them efficiently. From the standpoint of portability, of course, a magnetically-operated gun would present a more reasonable problem and would, no doubt, bring a substantial return. The gun should operate as rapidly as the powder-operated guns of today and should be effective over the same distances.

35. Many coal mine disasters entomb miners alive leaving them entirely cut off from the outside world. If some means of producing a signal system that would be effective in all cases of this nature were devised, many lives would be saved by facilitating rescue work. Wireless has not proved practical for this purpose owing to the elaborate apparatus that is necessary for transmission and the technical knowledge that is required to operate such a transmitter.

36. The late Dr. Steinmetz proved that if only a small percentage of the total energy of the sun that falls upon the earth in the form of heat waves was captured for the use of man, the power problem of the entire world would be solved. If a method could be devised whereby this solar energy could be directly converted into electrical current, power-producing apparatus of the type now used would become obsolete in a few years and the vast quantities of coal now used could be made to give up its valuable chemical constituents for other purposes. Thermo-electric batteries might be used for this but this battery is in an undeveloped state and unsuitable for the purpose. A thermo-electric

cell is one in which an electric current is produced when the elements of the cell are heated.

37. A new method of contact for street railways is needed. The third rail systems now in use in large cities like New York and Chicago are rendered practically useless by ice and sleet. This was demonstrated during the winter of 1920 when the third rail systems of New York were out of commission for nearly a week at a loss of several millions of dollars. A system is needed that will eliminate overhead wires and yet will avoid the troubles now caused by third rails, and thus be applicable also to the needs of electrified railways other than street-car systems.

38. An electrical high-tension insulator for use on heavy transmission lines where the discharge will always flash over the petticoat before puncturing would find universal use. The contour of the insulator would have much to do in bringing about this result.

39. Electrical locomotives are now widely used in mining operations but danger is involved because of the sparking controller contacts. Where fire-damp is present explosions can be caused from these sparks and a method of eliminating such disturbances within the controller box would add security to the use of locomotives for this purpose.

40. A magnetically operated rock drill would replace all the pneumatic devices where electric current is available. The drill to compete with pneumatic devices of this nature should be able to do everything that they do.

41. An electrically operated saw or cutter for use in coal-mining operations would greatly facilitate the removal of the deposits.

42. The proper handling of lightning discharges that strike high voltage transmission lines has always been a problem with electrical engineers. A more effective lightning arrester that will handle the heavy discharges and entirely remove the hazard of service interruptions will bring comfortable wealth to the inven-

tor. Great quantities of literature along this line will be found in the proceedings of the American Institute of Electrical Engineers. These proceedings are usually available in public libraries.

43. High voltage lines, owing to the great difficulty in insulating them, often develop serious leaks which waste a great deal of the energy that flows through them. Owing to the high voltages used, great danger attends the search for these grounds and leaks while the line is in operation. A leak detector that can be used with safety while a line is in operation will do much toward reducing the cost of current transmission and in the conservation of life among those employed in line maintenance.

44. At present all of our iron ore is reduced to metallic iron, or pig iron as it is called, in the terrific heat of the great blast furnaces. Owing to the construction of blast furnaces, appalling quantities of heat produced are dissipated into the atmosphere and the system is not an efficient one. It is possible to produce iron electrolytically as is being done with copper and some other elements. The system, of course, must be economically sound to be commercially successful. By using an electrolytic process iron that would be practically chemically pure could be produced. The only drawback in this system is the polarization of the electrodes.

45. Oftentimes service is interrupted in the rural districts when line fuses blow. An automatic magazine fuse that would bring another fuse into position, completing the circuit, would be welcomed by the electric light companies.

46. The larger electric transformers must be kept cool by pumping oil or other liquids through their cases. Although this system is in wide use, it is not completely effective and there is plenty of opportunity for the ingenious inventor to devise a system of keeping transformer windings cool that will not involve such elaborate preparation. Transformers with hot windings always operate at low efficiency, and a great deal of current is wasted by the increased resistance.

47. Electric pianos in amusement places are now operated with electric motors that cause the hammers to strike the various strings in the usual manner. It is a well-known fact that if an alternating current at a given frequency, say 250 cycles, is allowed to pass through a magnet placed under a piano wire tuned to this frequency, the wire will vibrate in sympathy with the magnet and produce its characteristic note. If a simple means of producing electric currents in the necessary range of frequencies could be devised, an electric piano operated entirely by a few electromagnets could be produced. Such a piano would have no moving parts such as electric motor or hammers and might produce a quality of music entirely different from that now made by mechanically-driven devices.

48. Successful gas meters that deliver a given quantity of gas when a quarter is dropped into them have been in use for a long time, but a successful electric meter on the same principle has not as yet been devised. Such a meter would find wide use in summer cottages and transient apartment houses.

49. Electrically-operated air washers for use in conjunction with large turbo generators. Mr. C. B. Humphrey of the American Spray Co., of New York, says: "In many cases the distance between spray particles is equal to hundreds of diameters of each dust particle even with extremely fine sprays in the densest spray washers now built. A thorough realization of this condition will make it apparent that in density of spray alone, no matter how great, one cannot help but produce an efficient washer."

50. A laboratory high-grade direct current ammeter in which shunts of different range could be introduced across the motor terminals by simply turning a handle would be a useful and highly appreciated device in experimental laboratories.

51. The late Charles P. Steinmetz had this to say in the American Institute of Electric Engineers' proceedings of 1918: "I hope to see a lightning arrester of the type of the oxide film which has no spark gap but is permanently shunted across the circuit

and is capable of taking care not only of the over voltages but equally well of steep wave fronts and high frequency oscillations. Even if lower than the circuit voltage such an arrester would give universal satisfaction."

52. There is needed an electric iron that will have only about half the weight of the present device yet equally good in ironing efficiency.

53. An electric toaster that cannot burn bread and that will handle four slices at a time without using more current for heating than the present devices would be welcomed by housewives.

54. Cords on electric irons are a constant source of trouble and annoyance to those who use these devices. They are constantly breaking and giving trouble, getting in the way, etc. Some method of holding the cord up in such a way that it will not give trouble or better still of eliminating the cord entirely would be welcomed by every user of this device.

55. Water mains, gas pipes and metal conduits of every kind as well as the underground portion of steel buildings are oftentimes greatly damaged when in the vicinity of street railways. This is caused by what is known as electrolysis. There is a certain amount of the electric current which leaks from the rails through the conducting earth and causes electrolytic dissociation. In severe cases losses may run into many hundreds of thousands of dollars a year. Engineers seem to be practically helpless in devising a system that will overcome this nuisance.

56. An electric socket having but half the number of parts used in the present sockets would make a great deal of money for its inventor. The socket must be able to open and close the electric circuit without any danger of short circuits or the formation of destructive arcs that will tend to cause fire or damage to the parts.

57. The automatic sprinkler systems used in fire protection of factories often release water when there is no fire. This is due to

the failure of the low temperature alloy that is used for sealing, as well as lack of a positive instantaneous means of shutting off the water if a small fire beneath one sprinkler opening is promptly extinguished, as is often the case. During nights and Sundays and holidays these systems often cause a great deal of water damage by premature operation. An electric alarm is needed that will minimize such accidents. It might be possible to install an automatic radio call system that will bring the alarm to the central office of the Sprinkler Company so that a workman can be immediately dispatched to the building where the water has been released. All large cities have such an office, but it remains for the inventor to find a practical way of notifying the proper authority when these accidents occur.

58. Some practical device that will form a non-corroding low-resistance electrical connection would find wide use in the electrical field. It should be free from shocks so that there will be no possibility of a loose connection being made. This applies more to small current carriers rather than larger cables where solder is seldom used.

59. Metallic contacts used on electrical starting boxes and other equipment corrode and burn through constant use and there is an actual need for a contact point that will have none of these undesirable features. Certain alloys can be used which resist corrosion to a great extent but they are not sufficiently cheap and workable with standard metal cutting equipment to be available for this purpose.

60. Millions of attempts have been made to produce a simple plant for the conversion of wind into electric power. This is especially needed in farm districts to supplant the gas engines now used for lighting and power purposes. Of course, it is always necessary to use storage batteries for this purpose and the plant should be as near automatic and fool-proof as it is possible to make it.

61. Electric dish washers have been more or less successful but their cost has interfered with their general use in the home. A cheap electric dish washer that will perform satisfactorily for home use and that will meet the necessary requirements of sanitation will find a number of interested manufacturers.

62. An electrically-operated envelope opener that will dispose of a large number of envelopes within a short time would be a great help in institutions that receive large volumes of mail daily. It should be a motor-driven device operating on a very simple principle and should be low enough in cost to appeal to relatively small businesses.

63. The pencil sharpeners of today leave much to be desired. They are great wasters of pencils in that they break leads too easily. A motor-driven pencil sharpener that will conserve pencils and put the proper kind of a taper on the exposed lead would find many thousands of users in the larger offices of the country.

64. Many of the moulded insulators now used for radio panels and other electrical purposes have a fairly high dielectric strength and resisting quality until they absorb a certain amount of moisture which most of them do. In some cases certain compounds of this nature drink in as much as 10% of moisture. A method is needed whereby this moisture content will be reduced. Perhaps some compound can be applied to the surface of the materials of this nature that will prevent water absorption.

65. The heavier the current used in the arc light the greater the efficiency of the arc will be. The efficiency of the light seems to depend upon what is known as the current density which means the amount of current used per square inch of centimeter of the cross-section of the carbons used. A lamp that would operate with extraordinary high currents would meet with instant application in many fields.

66. A simple little electrical device that would sterilize tooth brushes and keep them in sweet and pure condition would be

welcomed into many homes. Of course, its cost must not be out of proportion to the service it is capable of performing.

67. There is still plenty of opportunity for the ingenious inventor to devise a new and cheap electric sign suitable for use in windows of small merchants. It should be neat in appearance and changeable so that various notices can be placed in it with every appearance of the professional touch. Of course, signs that move or that cause some optical illusion by a very simple means are usually most successful.
68. Removing hot toast from a still hotter toaster is a very awkward process the way toasters are constructed at the present time. If there was some little mechanical attachment that would release the toast with no danger of burning the fingers, it would be sure to attract housewives who have learned to handle this device gingerly at the breakfast table.
69. In many electrochemical processes automatic electrical control apparatus regulates the flow of certain liquids. A method of checking these automatic devices so that they will be accurate at all times is needed.
70. A non-kinkable, unbreakable telephone cord that will successfully withstand all the abuse it is subjected to in telephone service would be a welcome contribution to voice communication. Such a cord must be highly flexible and yet sufficiently strong to overcome these tendencies. The cord should also be so constructed that it will not communicate local noises to the telephone receiver.
71. Graphite is often mixed with fusible clays as binders for the manufacture of high-resistance units. According to present methods of manufacture it is practically impossible to mix the graphite and the clay in such a way as to produce uniform results. Two rods that are produced in the very same batch of material will be found to have different resistances, although they are of the same size and shape. A process that would guar-

antee uniformity with respectable precision would increase the use and lower the cost of these devices by a great margin.

72. At present it is practically impossible to construct a high-resistance electrical unit of anything but metallic alloys that will not change with age. For instance, the grid leaks used in radio often have a resistance as high as 5,000,000 ohms, but this resistance changes with age due to some kind of a rearrangement of the molecular carbon particles deposited on the paper. The same holds true of high resistance units constructed with other materials. A process whereby this objection could be overcome will create a small but flourishing industry for the supply of resistance units to the electrical trade.
73. If a combination vacuum cleaner and floor washer could be worked out in such a way that the cost would not be prohibitive, a very tidy sum could be netted through its exploitation.
74. Numerous experiments have been made in applying high-potential, high-frequency electric currents to agriculture. It is a known fact that treatment by such currents greatly accelerates the growth of practically all plant life but as yet no cheap system has been devised whereby the farmer can apply this process profitably to his daily needs. All of the central power stations in the country stand ready to run power lines into the rural districts providing some genius can find ways and means of making electro-horticulture a practical thing for plant cultivation. It seems to be simply a matter of reducing the system to a point where it will not be so costly.
75. A photo-electric cell is a device that changes its electrical resistance when light falls upon it, acting in somewhat the same manner as selenium. A cell is needed that will be more sensitive and instantly responsive to small variations in light. Like most of the other things needed in this day and age, it should be simply constructed so that its cost will come within the range of a few dollars.

76. A highly efficient electric furnace in which a very low percentage of heat developed by the arc or resistance will be able to escape. Such a furnace would reduce the cost of operation a great deal for inefficiency comes through heat radiation or heat that leaks off into the air without performing any useful service.

77. It has been found extremely difficult to construct an electric bell or buzzer in such a way that its armature (its vibrating part) will stay in adjustment. This also holds true for automobile horns operating on the same principle. A buzzer and bell is needed that will maintain its adjustment throughout a long period of time and that can be easily adjusted to the same frequencies of vibration should it happen to lose its adjustment.

78. A selenium photo-electric cell absolutely instantaneous in operation.

79. In hydro-electric plants in northern climates great trouble is had in handling ice floes and preventing jams at the penstock intakes. Simple but rugged equipment of patented construction of weirs is needed to overcome this nuisance which costs the power companies hundreds of thousands of dollars yearly.

80. If an electric bulb having a point source of high intensity illumination could be made, it would perform with high efficiency when used with a parabolic reflector. It is estimated that a few dry cells would be sufficient to throw a beam several miles with such an arrangement.

81. Large buildings could be protected from fire by more fool-proof electric fire alarm systems. If an alarm could be made to function on the mere presence of smoke, fires could be detected and checked before they had an opportunity of doing a great deal of damage.

82. A complete line of household appliances which have a third wire for grounding purposes.

83. There is still great opportunity to reduce the washing machine to a price level where it will meet with universal approval.

The need for improvement lies in the action of the water upon the clothes. This is always brought about by causing the motor to impart a certain action to the container.

84. A system for producing metal containers of various shapes and sizes by electro-deposition will be used providing this system of production can compete with the methods at present employed.

85. The efficient operation of motors is often prevented by dirty commutators which cause sparking, overheating of the motor and a general reduction in power delivered to the shaft. A self-cleaning commutator that will prevent the copper surfaces from pitting and accumulating particles of carbon and oil will meet with almost universal application on duty motors in large industries.

86. An ideal way of filling teeth would be that of depositing the metal in the tooth by electro-deposition providing some practical way of carrying out this scheme could be developed. Such a filling would be absolutely homogeneous in structure and would outlast the present fillings by many years. Electro-deposition would succeed in filling up every tiny crevice of the cavity and thereby produce a filling that would be very difficult to dislodge.

87. There is still a great deal of room for improvement in storage battery vent caps. These caps must be so constructed that they will allow gas to pass freely but should effectively prevent the passage of even small amounts of electrolyte when the battery is in motion.

88. The electrolytic principle of an electrolytic rectifier could be used in producing an oscillating current of high frequency in the manner of the vacuum tube, if the proper combination of elements and a circuit could be discovered for this purpose.

89. Small charcoal pots are placed in the orange groves of California and when the temperature reaches a certain low point during the night farmers are obliged to light the charcoal fires.

so that the crops will not suffer total destruction. If a simple electric system, thermostatically controlled, could be devised so these pots could be ignited automatically when the temperature dropped to a certain point the system would come into general use in California.

90. A generator brush that will not spark and that will leave little or no deposit of carbon on the commutator is needed. The solution of this problem would seem to lie in the physical or chemical composition of the brush. Above all its electrical resistance must not be so high as to appreciably reduce the current flowing through it.

91. An overheated motor is an inefficient motor. Overheating in the motor can be prevented to a great extent by the proper flow of air through the motor frame and windings. A plan of motor construction that will allow air to be sucked in at one side and forced out the other after passing over a large surface of the windings would be instantly recognized by many of our leading motor manufacturers as a distinct improvement.

92. What might be solved by good design rather than a high type of invention is the problem of producing a simplified high frequency outfit for medical purposes in offices of physicians. We find electricity being used more and more for medical purposes and the therapeutic value of high frequency currents has been demonstrated to the satisfaction of the entire medical world. The outfit should be compact and efficient and should also come within the pocketbook range of the smaller practitioners.

93. Condensers that pass high voltage current are often ruptured and rendered inoperative. A self-healing condenser that will meet the requirements of the present engineering standards would be welcomed by electric power companies.

94. An electric fuse that will prevent the formation of a destructive arc when it blows would meet with the instantaneous approval of the fire underwriters.

95. Although many improvements have been made in house wiring since conduit wiring came into general use, there is still an opportunity for an inventor to further simplify this work by producing a conduit that requires no pipe-threading tools of any sort.

96. A stage light with a combination of revolving color screens placed before it so that any color or combination of colors in the spectrum could be thrown upon a scene by means of a simple adjustment would be a welcome improvement in stage lighting.

97. A small electrically-driven machine to affix stamps to voluminous correspondence is part of the office equipment needed by large concerns. The government printing office now produces stamps in rolls that could be easily adapted to this use.

98. Direct current for traction purposes is more efficient than alternating current but at present it is not practical to produce it at voltages sufficiently high for long stretches of electrified railroads. If the alternating current could be rectified on the locomotive by means of a small battery of rectifying tubes, a much more efficiently operated locomotive with direct current motors could be developed by engineers.

99. Small synchronous motors, having more power than Telechrons, but costing less than Holtzer Cabots.

100. An alloy of hard metal that would withstand the application of considerable heat without oxidizing or corroding would be used on a large number of electrical devices employing contact points. A few expensive alloys like platinum and iridium are now used for this purpose but there is plenty of opportunity for work of the metallurgical inventor.

101. A wire terminal or post that will not have to be screwed and yet one that will hold wire tightly.

102. Years ago it was discovered that an electric current will be produced if the junction points of two dissimilar metals are

heated. Thermo-electric batteries that produce electricity directly from heat have been constructed but they are not efficient and there is still plenty of opportunity for some inventor to make this means of generating electric current more feasible from a commercial standpoint. The Engineering Department of any library has a great deal of literature on this subject and the average physics book treats it briefly.

103. A positive electric release which would operate the shutter of a camera at any speed, in perfect synchronism with the popular photo-flash bulbs, would be a winner if it could be sold for around one dollar. Present devices of this type are too costly for the average amateur snapshot enthusiast, and cheaper devices on the market at present are extremely inefficient and waste much film.

104. A voltmeter for very high voltages operating on the electrostatic principle and accurate to a small fraction of 1% is one of the necessities of the high voltage electrical industry.

105. A cheap electric meter that will be really accurate and that cannot be destroyed by overloading.

106. An insect exterminator electrically operated and based on a simple principle would probably not make a millionaire of its inventor but it would probably bring a very substantial sum, particularly if it could be made selective in its lethal effects on specific insects such as Japanese beetles, and harmless to useful species such as bees.

107. There are a number of instantaneous water heaters on the market today, but they use up a great deal of current and they do not impart to the water heat sufficient to last any more than a few minutes. The water molecules must be thoroughly agitated before they will give to the water the property of holding its heat.

108. Electric furnaces impose great punishment upon the refractory and heat-resisting bricks used in the lining. Conse-

quently furnaces have to be cooled and relined so frequently that a great deal of money is expended in keeping them in operation. A furnace lining that would last only half again as long as the present linings would so greatly reduce this expenditure of money that all users of electric furnaces would immediately adopt the new refractory providing its cost was not so much greater than the refractories now used that a substantial saving could not be shown.

109.* An electrically-operated sound detector that will locate the exact direction of an approaching submarine or airplane is needed by the army and navy departments of this country. A paraboloid of some kind may be used for this purpose since it will detect and focus sound only when placed directly in the path of the approaching waves. It might be possible to place a special microphone in the focus of such a reflector. Devices for this purpose are in operation but the opportunity for application of new principles is very great.

110. A non-corroding storage battery clamp would save many a stalled automobile motor and would be worth a great deal of money to its creator.

111.* There has been developed in Sweden and Norway where hydro-electric power is cheap a system for the fixation of nitrogen from the atmosphere by means of an electric arc. An improvement on this process that would reduce the cost of nitrogen produced even a cent or two per pound would make it applicable to the needs of this country and would result in a highly successful enterprise.

112. Electric soldering coppers overheat and as a result of this the copper points oxidize and become heavily pitted. This renders them rather unsuitable for further work. A method of producing a point for a soldering copper that will not corrode with a reasonable amount of overheating would be a profitable thing to develop.

113. Along the same lines as the above there comes the need for developing a commutator for motor generators that will not pit.

114. A stenographic device could be developed so that its operator could sit in an office and copy down notes that would be instantly transcribed by a typewriter in another room. There is a device on the market now called the stenotype which takes dictation much faster than the average man can think or speak. If this device could be adapted and connected electrically to a typewriter, a means would be created for producing typewritten letters at high speed which is one of the business necessities of the day.

115. There are a number of electric floor surfacers at the present time, but they are costly due to the rather heavy power required to operate the sander. A highly efficient, lightly constructed surfacer would meet with some success.

116. An electric bank for children that will ring a bell when a coin is put in and also if it is tampered with might be purchased by parents who have an interest in children saving.

117. There are still needed improvements in reading lamps. Great universality of adjustment without undue complication is still the thing that makes a reading lamp most serviceable. Sufficient intensity of light with absolute freedom from glare are the two great features that make a reading lamp kind to the eyes and valuable in the conservation of vision.

118. An electrical condenser that will have low electrical losses and low leakage will find wide application in the electrical field and in radio as well.

119. There have been a number of hand-driven dynamo flashlights on the market, but they have been heavy and so arranged as to produce fatigue when they are operated for long stretches. If this could be overcome these lights would be widely used.

120. An electric sign that will produce various effects and which may be changed daily or weekly by the merchant for use in his store window will be successful providing it can be sold for a small figure.

121. Stable capacity control for electronic relays.

122. A lamp that will produce a gentle flow of ultra-violet light and a certain amount of reflected heat for the treatment of various skin diseases is needed. The lamp should be of a design that will permit of easy production so that the small physicians will be able to afford them.

123. A new way of suspending the needles or pointers used in electrical measuring instruments is one of the needs of the electrical industry. A non-frictional, wear-proof bearing is needed.

124. A simple meter that can be attached to a telephone and that will tell the user how long a telephone has been in use during a long distance call would be used by some of the larger companies.

125. Intensifier for combustion engines to enable use of propane gas.

126. A soldering copper with a heating element that will be renewable and that can be installed by any user is something that would appeal to many persons.

127. Although electric batteries form a very convenient and cheap source for small amounts of electric power, no inventor has as yet assembled a practical electric clock driven by a dry-cell battery. There is no reason why a clock cannot be constructed that will operate with a single dry cell for at least a period of one year. It would easily be portable around the room and would also appeal to campers and cottagers where electric current is unavailable.

128. There is plenty of opportunity for an ingenious inventor to design and construct an electrically-controlled home heating

furnace. The thing should function to keep the furnace at a uniform heat so that changes in draught and wind would be automatically taken care of. The device should also be able to turn on the draughts at a predetermined time so that the house would be heated in the morning.

129. At present millions of small mica condensers are used in the radio industry and each one of these is assembled by hand. A thoroughly machine-made condenser is by no means beyond the realm of the possible and it would reduce the cost of producing condensers by a large margin.

130. At the present time pneumatic brakes are used universally on electric railways and yet there is no reason why a well-designed magnetic brake could not be developed for this purpose. A good design practicable for automobiles would have revolutionary possibilities.

131. In the lathing of certain parts a magnetic chuck that would be operated by the simple closing of a switch would greatly facilitate production in factories and reduce costs. This would be especially true where men are engaged in machining one part continuously.

132. Application of refrigeration to cooling of electrical machinery.

133. A dry and wet battery with easily replaced elements that will renew life will meet wide use for household and other purposes. Dry cells are discarded today while all their elements save the zinc are as good as new.

134. Annunciators are oftentimes unreliable in that the numbers do not stay posted after the impulse has been received. An annunciator with one moving element that would be infallible in signalling would find a wide application.

135. In the winter time many fires are started in homes by the careless use of blow torches in attempting to thaw out frozen

pipes. An especially designed electric heater for this purpose that could be applied directly to the surface of the pipe would not only minimize the danger of fire through the absence of flame but would provide a very inexpensive means of creating heat for this purpose.

136. Some kind of a small tool, motor operated, that would rapidly remove paint from flat surfaces would be a much more effective means than that now employed. Painters usually use a blow torch and a putty knife to remove paint. This is slow and the danger of fire is always present.

137.* An ultra-sensitive microphone. This would have application in many detection and other instruments of military importance, not only in airplane and submarine detectors but in warning devices for the protection of factories.

138. There is no reason why dry cells or house lighting current could not activate a calendar which would always show the exact day, month and year without attention. The inventor who produces such a device in sufficiently inexpensive form will find wide acceptance for his product.

139. A system for shifting wall fixtures to various positions assuring good electrical contact and freedom from fire risk. This would enable lighting brackets to be moved to conform to changes in wall decorations and furniture.

140. A practical and cheap method of covering third rails to prevent accidents.

141. Electrical amusement devices for use in parks are very popular and there is plenty of opportunity for the ingenious inventor to provide new thrills.

142. A combination electric heater and electric fan that will supply both hot and cold air is a combination that has not yet been perfected to the satisfaction of the public. The heating device should in no way interfere with the air currents produced by the fan blades.

143. A small magazine fuse suitable for household use and which would sell at a nominal figure would find wide application.

144. It is necessary to establish a good electrical connection with the ground in certain electric circuits and this connection should be at low resistance and should be capable of standing up for a number of years. Certain combinations of chemicals encased in perforated containers have been used to establish connections, but they do not meet the requirements of careful engineering. It would seem that the principle is sound, but the improvement lies in the choice of the chemicals which should function and maintain a certain moisture content.

145. A lightning arrester of the vacuum or non-vacuum type that will discharge instantly at a predetermined voltage is an electrical need of the day. The present arresters are unsatisfactory in many ways.

146. An electrical heating element for utilities of various sorts that can positively be guaranteed against blowouts will make its inventor both a reputation and a fortune.

147. Snap switches for electric lighting circuits function by the aid of a spring and since springs do not hold their life such switches become ineffective sooner or later. This may cause destructive arcs to be formed when the circuit is opened. There is a need for a switch that will not operate on the spring principle but will effectively and instantly close or open a circuit with no danger of destructive arcs being formed.

148. When dry cells are used for a great length of time and the current pulled from them is beyond a certain critical value polarization sets in and the voltage of the cell drops very rapidly until little current is flowing. Although the cells recuperate if they are permitted to stand for some time without use, this drawback greatly interferes with their wider application. Polarization is due to the accumulation of small hydrogen bubbles on the nega-

tive element. These bubbles offer a high electrical resistance and quite naturally cut the current down. Some kind of a chemical placed in the cell that will prevent the formation of these hydrogen bubbles will make more efficient dry cells possible.

149. Bad inductive effects in telegraph and telephone lines often make communication between widely separated points very difficult. Some simple and effective means of getting rid of these stray currents will be welcomed by communication engineers.

150. Flash lights have been made small enough to be used generally as a pocket device. Some have been made the size of a fountain pen but the light they afford and the life of the battery that operates them is so small that the thing can be called little more than a novelty. If a small but powerful battery (not necessarily a dry battery) could be provided it would be an easy matter to design a flash light to weigh much less than the present lights and at the same time give just as abundant a source of illumination.

151. Some day a clever inventor is going to startle automotive engineers by developing an electric booster for steering wheels which will make steering an automobile absolutely effortless—a result much advertised at present, but not yet honestly achieved.

152. A number of lives are lost annually in the repair of high voltage transmission lines. If some sort of a practical suit that would afford protection against high voltage currents could be developed linemen could perform their work more rapidly and there would be less danger of fatal shock.

153. In the vicinity of icebergs the water is colder and it seems that some protection could be given to vessels if they carried a thermopile below the water line which would detect the sudden change in the temperature of the water and in this way give a warning of the presence of the iceberg. A thermopile, it will be recalled, is nothing more or less than the junction of two dissimilar metals which will generate a current the value of which

depends upon their temperature. While this system has been experimented with nothing of great value has come from it to date.

154. Although wireless telephony has been applied to some extent on railroads it has not as yet reached the stage of development where it is capable of performing with the necessary efficiency for this purpose. There is still a need for a simple non-radio system of communication from railroad coaches to stationary points.

155.* Electrically-heated garments have been employed for use in airplanes for flight at high altitudes. Such garments have not been perfected to a point where they can be produced cheaply and where they are not in need of constant repair.

156.* Although much publicity has been given to so-called death rays, it is safe to say that a practical emanation that will paralyze electrical apparatus such as magnetos and high voltage coils has not been produced. Such a device would be of tremendous value during war time inasmuch as gasoline-operated engines could be made inoperative by it.

157. A pressure gauge built on an electrical principle.

158. By using certain minerals at high temperatures in electric furnaces artificial gems of a very beautiful variety have been produced. Even diamonds on a small scale were created by this system through the efforts of Moissan, a French experimenter. The diamonds produced by Moissan were microscopic and valueless for commercial purposes but they proved the enormous possibilities of this method of production. By fusing new combinations of mineral matter gems that are now unknown can be produced on a satisfactory commercial scale.

159. All electric motors need special starters when the current is fed to them so that they will pick up speed gradually. A high-powered motor that will not need a starter is a possibility of engineering.

160. A method of testing high voltage cable and of charting its performance before installation.

161. If an electric spark is permitted to pass through air a certain amount of ozone is created. This could be used for the purification of air in factories if a satisfactory producer of the ozone could be designed. It might even be possible to pipe the ozone to various parts of the factory from a central producing plant.

162. A system of thermostatic control in electric cook stoves for automatically maintaining a predetermined temperature.

163. The Grove gas battery is a very efficient method of storing electric current but for some reason or other it has never been commercialized. A good deal of data can be had concerning this subject by reference to the average physics book.

164. A practical suit made of material that will not permit the passage of ordinary voltages. Rubber is out of the question since it interferes with the body process of proper respiration.

165. On many of the farms in California artificial irrigation systems are used and motors are expected to run for long periods in out-of-the-way places without attention. Overheating often occurs and the motor simply runs itself into bad condition. An automatic switch that will control these motors and open the circuit before a destructive temperature is reached is needed.

166. The accidental grounding of wires in high voltage transmission lines is very dangerous and often causes loss of human life as well as property. Some sort of a ground detector and ground alarm that will give ample warning is needed. The static ground indicator now employed for such purposes is not sensitive enough for this purpose. The Accident Prevention Committee of the National Electric Light Association, Cleveland, Ohio, is very much interested in this problem and its solution.

167. Improvements in the design and employment of wave filters in the study of alternating current phenomena are needed. This is especially in connection with the study of deep front waves. Inventions made in this field might also be applied to radio since filters of the condenser type are used a great deal in radio transmitter and receiver circuits.

168. A method of using vacuum tube amplifiers in place of electro-static voltmeters and also for use in oscillographs without disturbing the circuit.

169. When thin sheets of solid insulating material are tested for dielectric strength, it is practically impossible to avoid the formation of a corona discharge at the edges. As a result of this, breakdown often occurs in a non-uniform field and poor result from the standpoint of scientific accuracy is obtained. A newly compounded oil that will prevent this is needed.

170. Manufacturers of low voltage generators are anxious to find new uses for dynamos producing from two to ten volts. These uses should be aside from plating, electrotyping and battery charging.

171. A simple design for a two kilowatt motor generator set or rotary converter is needed in which the single phase synchronous motor obtains excitation from the six volt generator it drives. The outfit should have good starting torque and unity power factor characteristics.

172. It often happens that telephone operators and subscribers are annoyed and even mentally shocked by the loud snapping and cracking of the diaphragm of the telephone receiver. This is often due to active interference from parallel power lines and the present telephone protector gap, which consists of a pair of carbon blocks separated by a mica spacer with a slot in it, is not sufficient to care for this discharge. Acoustic shock is liable to occur when this gap breaks down because of the flow of current from the side of the line which does not ground through the

receiver to the side which is grounded by the gap mentioned. Gaps should be made so that they will insure both sides of the circuit being grounded at precisely the same instant.

173. A new and more efficient method of exciting X-ray tubes is desired by the manufacturers of such devices as well as by the users. Scientists have found that the ideal current for such use should consist of impulses of extremely high voltage but of very brief duration, yet they should be sufficiently sustained to have an appreciable time factor.

174. Much trouble is had with the contacts on circuit breakers. It has been suggested that the contact should be shaped so that the mechanical forces due to the large current at the first instant of a short circuit should tend to press the contact surfaces closer rather than to separate them. This would allow the necessary time for the tripping mechanism to act and prevent premature arcing which is so destructive to this type of machine.

175. In arc lamps the efficiency is increased by increasing the current density in the carbon. This is usually in the neighborhood of .15 of an ampere per square millimeter of the cross-section of the positive carbon. If the arc is concentrated by the action of external magnetic fields, the current density may be greatly increased. Some method of using this principle for the construction of high efficiency arcs is desirable.

176. A method of preventing disturbance in telegraph and telephone lines due to the magnetic disturbance in the earth which is usually caused by auroral displays.

177. A method of measuring the intensity of an electric field by observing its effect upon a beam of polarized light passed through a small crystal.

178. Some method of quickly locating the electric faults and troubles in underground cables. The present systems are in many ways unsatisfactory.

179. A method of overcoming inductive effects in telephone lines. It might be possible to apply the vacuum tube in such a way as to accomplish this result.

180. According to the present method of applying high potential current there is a failure to impose that strain on the insulation within a coil or between adjacent coils of a phase. For instance, in the case of a fully connected machine it fails also to impose any test between phase windings where the highest potential exists when the machine is operating. A method of overcoming this shortcoming would be welcomed by many of the larger electrical manufacturers.

181. There is a great deal of room for improvement in the construction of secondary leads and bushings in the potential transformer. An arrangement is needed that will prevent oil from siphoning up through the leads and leaking around the bushings.

182. The application of a refrigeration system to the cool operation of power transformers.

183. In trans-Atlantic oceanic radio, alternators giving constant frequency currents are used. The present alternators are very hard to control and some device that will keep their speed and load absolutely constant is desired.

184. There is still need for a great deal of improvement in electric welding practice. Research along these lines should have to do with the size and nature of electrodes, current density, preparation of welds, etc.

185. A special type of current transformer for metering large installations is needed.

186. A current transformer so designed that half of the secondary winding can be reversed, thereby giving a differential transformer.

187. The use of resonant shunts, similar to those used on power lines, has been proposed for communication circuits. Such shunts have been used where telegraph service is disturbed by the fundamental frequency of nearby power circuits and have proved successful in telegraph lines paralleling 25-cycle and 60-cycle power systems. Investigation is desired as to their applicability on telephone circuits.—Inductive Interference Committee, N.E.L.A.

188. The attention of manufacturers is directed to the desirability of developing two types of indicators for water-cooled transformers, first an adequate type of sight-flow indicator for open systems and, second, an indicator for closed systems, which will indicate or sound an alarm, either on failure of water or on increase of pressure due to clogging coils.—Electrical Apparatus Committee, of the N.E.L.A.

189. It has been shown that watt-hour meters of the inductive type are inaccurate on heavy overloads. Some sort of a simple little arrangement that will automatically correct overloaded meters is needed.

190. One of the most perplexing problems regarding transformers in a distribution system is to know the load conditions under which they are working. It is desired that a load indicating device be developed which shall be inexpensive and so designed that transformers now in service may be equipped with it. It should be maximum-reading and indicate whether the transformer has been overloaded. It should be made so as to permit resetting at any time and should preferably be visible from the ground.—N.E.L.A., Overhead Systems Committee.

191. There is room for a great deal of original investigation and development in the problem of governing and regulation in combined steam and hydro-electric plants. It has been found difficult to operate such plants in parallel owing to poor frequency regulation of the hydro units. Information is desired as

to the best relative regulation or inherent drop of hydro and steam governors under various conditions of water flow.—N.E.L.A., Prime Movers Committee.

192. Liquid glass at high temperatures is a fairly good conductor of electricity. It might be possible, working on this basis, to develop an electrically-heated glass furnace of the resistance type.

193. One of the most important steps to be taken at this time is to make available a set of comparatively rugged and fairly accurate field instruments with which the essential data on the communication circuits as well as on the power circuits while under regular operation may be obtained. Otherwise the information will continue to come in the form of qualitative, inaccurate data and personal opinion.—H. L. Wills in N.E.L.A. Bulletin.

194. The present method of rating the interrupting capacity of oil circuit breakers is on the basis of a duty cycle, which is intended to be representative of operating practice. However, no single-duty cycle can fully represent very many working conditions, and it is recommended that the ratings of all oil circuit-breakers should be made with reference to several duty cycles, and that curves be drawn of the ratings as against the various operating conditions.—N.E.L.A., Electrical Apparatus Committee.

195. An earth coil for power circuits has been described in the foreign technical press by W. Petersen, of Darmstadt, and has been used on a few lines in Germany and Switzerland. It consists of a reactance coil which is connected between the neutral point of star-connected transformers and ground and is of such dimensions as to be resonant to the capacity of the transmission conductors to ground at the normal frequency of the circuit. It is claimed that such an arrangement eliminates oscillatory discharge from arcing grounds and limits the flow of fault current to a relatively small quantity. A careful detailed investigation of this method is desired.

196. The committee urgently recommends that more study be given to the design and installation of current-limiting reactances, circuit breakers, instrument transformers and protective devices, and also that ample clearances be allowed not only in new installations, but also on older installations before interconnection with systems of large capacity is made.—Accident Prevention Committee, N.E.L.A.

197. A method of burning low-grade fuel without clinker trouble under standard power boilers.

198. Method of testing should be evolved so that by means of some simple measurement it may be possible to determine the radiation constants of different portions of conduit lines in service and establish current ratings of transmission cables as to eliminate the burnouts due to overloads.

199. Two or more strain insulators are usually employed in series for dead ending heavy feeders on moderate voltage lines. It has been figured that the cost of turning a corner with this means is quite high as compared with supporting the feeder on a tangent. A more economical and reliable method of dead ending is a need of the industry.

200. With a more detailed study of paper and cambric used in high tension coils and machinery, it becomes desirable to photograph individual fibres under the microscope. The necessary technique and instruction will be found in Technological Paper No. 217 of the Bureau of Standards by R. E. Lofton.

201. A system for fighting oil fires in electrical apparatus under the conditions obtaining with transformers, circuit breakers, etc.

202. There is still needed a method for determining the potential gradient in a leaky dielectric subjected to a given overall voltage drop.

203. A very fruitful field of research will be found in diathermy which covers means of producing high frequency currents to be

used in connection with the treatment of human ills. It is a means of producing gentle warmth above body temperature.

204. Most annealing of non-ferrous metals is carried out largely in gas-fired or oil-fired furnaces. The application of electrically-heated furnaces to this field is to be desired since there will be less oxidation and a far more perfect regulation of heat.

205. There has been a great deal of trouble with current limiting reactance coils used in between generator leads on account of insufficient mechanical strength. Being subjected to continuous vibration these coils in time become loose and sometimes the arc becomes shorted. There is a great deal of possibility of improvement here.

206. Any irregular wave form may be resolved into sinusoidal components. This may be done analytically, graphically or through the medium of a mechanical analyzer. All of these methods, however, are terribly tedious or require elaborate and expensive apparatus. Prof. F. S. Dellenbaugh, Jr., described an electric analyzer in the A. I. E. E. Journal on page 135 of the 1921 edition. This instrument, however, did not have a full range of usefulness because it was designed only for a few lower harmonics. The result is based on only eleven ordinates of the half wave of 15 degrees apart.

207. Some investigation of the characteristics of three-brush generators may be profitable to those who undertake this work.

208. A method of overcoming the interference of electrical storms associated with sunspot activity which frequently disrupt short-wave communication very seriously.

209. There is a need for a rapid and accurate commercial method of testing current transformers in advance of what has been available up to the present time.—Meter Committee, N.E.L.A.

210. There are two well known ways of hardening copper—by means of mechanical working and to alloy it with a certain

amount of another metal. Further investigation is desired as to the exact properties and the relative advantages and electrical uses of the copper hardened in the two ways.—Bureau of Standards, Washington, D. C.

211. Information has been requested regarding the simplest and least expensive means of building a condenser of $\frac{1}{2}$ mfd. to mfd. capacity, 100,000 volts, for the purpose of extending an investigation on the spectrum of explosive discharge through fine wires.—National Research Council, Washington, D. C.

212. With high heat electric furnaces the carbon electrodes are screwed together by threads and in this way a constant feeding system is evolved. However, owing to the high heat and constant tilting of the furnace these electrodes become loose at the joints and trouble develops. A more satisfactory method of making an electrode joint that will withstand the passage of heavy current might be a very profitable thing to do.

213. It seems that tests have shown that most potential fuses on the market cannot satisfactorily open circuits without a resistance in series with them. The determination of the proper resistance for different uses is needed.

214. In the Campos system of surge protection the reactors are shunted by energy-absorbing resistors. A more efficient method of surge absorption is desired.

215. A new method of converting frequencies. For example, when three power companies, one producing 25-cycle current, another 40-cycle and the third 60-cycle feed their output to a common terminal, there should be some method of producing a single cycle current from the three without undue electrical loss.

216. In electrical machines that part of them which comprises the air gap and the adjacent portions of the two iron cores with their windings is known as the active layer of the machine. The principal electromagnetic phenomena and all consequent energy

transformations take place in this layer. If some investigations could be carried out in connection with this subject, some information of great value in the design of such machines might be produced.

217. A practical method of anchoring electric light clusters to all sorts of vases, urns, etc.

218. Improved starting switch for alternating current motors is needed.

219. An electric hammer small enough to be carried about by a single person. This should, of course, operate on the electromagnetic principle.

220. A method of preventing train and trolley wires from snapping in cold weather.

221. An electric soldering iron with a handle that will always remain cool.

222. A waffle iron that will lift out waffles when they are done, delivering them, perhaps, like the "pop up" bread toasters.

223. A pocket flashlight that can be focused more easily.

224. Vari-speed electric motor which will give constant horsepower output at any of its variable speeds.

225. A new tool to strip the insulation from electric wires. It should work faster and prepare the wire for soldering in the same operation. With the present scrapers, the wire has to be again scraped with a knife to remove the final traces of the rubber insulation before the solder can be applied.

226. A wire-splicing tool that could be used by electricians and that would save time. A tight, neat joint should be produced quickly.

227. An electric heating pad that can be guaranteed against short circuits and that will not cost any more than the ordinary

pads sold today. Perspiration from the wearer sometimes causes dangerous short circuits in present devices.

228. An electric heating pad the heat of which can be regulated to any temperature. The present pads have only three heats.

229. Electrically-heated hot water bottles would be big sellers if they were cheap enough.

230. A new and easier method of installing electrical conduit that will pass underwriter inspection.

231. A tool is needed whereby electricians can quickly and easily lead a splice without the application of high heat.

232. A more simple and less expensive tool for cutting off BX electric cable.

233. An electrically-driven eraser built on the vibrator principle that can be used in drafting offices where large amounts of erasing have to be done.

234. An electrically-driven carpet sweeper (not vacuum cleaner) would be welcomed in large homes. The carpet sweeper is still very popular with women who use it for brushing up every day.

235. An electric light socket designed with a slip ferrule so that it would not be necessary for a bulb to be screwed into place.

236. An electric hand lamp with the reflector arranged on a swivel so that the light beam could be adjusted either up or down when the lamp was placed on a table or the ground.

237. A method of insulating flat irons of the electric type so that little or no heat will escape through any part but the bottom.

238. A small electric clothes drier for home use that can be folded up and placed in a closet after use.

239. A device or method of locating burned-out Christmas tree bulbs (in the cheap sets so wound that all light bulbs go out when one is defective) would be a welcome gift for any family.

240. Electric connections where they enter appliances have the habit of breaking off and causing short circuits. This would be prevented by the use of a sort of "universal joint" connection.
241. A photo-electric egg candler that will operate at high speed could be used by dairy dealers. The present device is far too slow.
242. An electrical suction device that will clean out kitchen sinks and other plugged plumbing. The hand suction devices do not create a sufficiently high vacuum to be entirely effective except in mild cases.
243. A handy little motorized shoe cleaner would be a real winner if it could be sold for \$20.00 or under. The device should be so constructed that one would merely place one's foot in the machine to start the brushes.
244. An electric ice box with a vacuum between the walls would be at least 100% more efficient than are the present boxes. This invention would amount essentially to a design that would withstand atmospheric pressure and that would be made cheaply.
245. Inasmuch as the contact points of door bells and buzzers corrode as they grow older, there is needed electric buzzers and door bells that will operate without contacts.
246. A waffle iron that would not overflow would find its way into several million American homes.
247. An electric varnish remover that would really do the trick would be bought by every painter and paper hanger in the United States.
248. There is still needed some form of protection against theft of electric light bulbs that are used outdoors.
249. Small, inexpensive solenoid for use on alternating current with constant quick response characteristics, even though the current to the solenoid be closed for only a small fraction of the current cycle.

250. Electric light bulbs blacken as they grow older due to the tiny particles of metal that leave the filaments and adhere to the walls of glass. A method of preventing this would be worth millions.
251. An electric door bell that will tell when the family is out would be useful—even at times when the family is not out.
252. A photo-electric exposure meter for moving picture cameras that will automatically set the aperture and speed of the camera.
253. A portable electric pipe-welding device for plumbers and steam-fitters.
254. The present electric coffee percolators cannot be immersed in water for cleaning owing to the electric heating coils. There is needed a new type of coffee percolator that will overcome this difficulty.
255. A little electric generator geared to one of the wheels of a bicycle would offer a constant source of current and prevent accidents. It would supply both a head and tail light.
256. An automatic electric garage door opener operated by a steel pad in the driveway would be useful on rainy nights—or any time for that matter.
257. Brokers mail large numbers of registered packages each day and these packages are usually sealed with wax. An electric wax sealer would be useful in such work. The sealer should melt and feed the wax in the proper quantity.
258. A one-piece plug of the heavy current type for flat irons, toasters and the like. The present plugs are made in two pieces held together by machine screws and nuts that have the habit of becoming loosened and lost.
259. Many electrical short-circuits are caused by the frayed ends of wire in plugs. A short-circuit-proof plug would be insisted upon by the underwriters if such a thing existed.

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2100 NEEDED INVENTIONS

260. Electric and gas meters that would give readings in dollars and cents would save many arguments on the part of the various utility companies and would be readily acceptable by the con-

ELECTRICAL

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271. A method of brewing tea electrically.

272. An electric bug trap that can be used for all forms of

etc., find their greatest applications in frequencies of this order. An entirely new field might open up were we able to obtain high transmitter powers on these frequencies.

281. More efficient carbon arc lighting equipment for preserving the delicate details of type in the process of transferring the photographic image to the metal plate.

282. A substitute for that electrical conductor known as "BX" which consists of two rubber-insulated wires inside a spiral of iron tape. The substitute should be one rubber-insulated wire inside a metal tube which is thin, tough, ductible, seamless, and capable of being bent around corners. The wire is to be the "hot" side of the circuit, and the metal tube the grounded neutral of the system.

283. Method of salvaging used electric light bulbs. The waste in bases of photoflash lamps alone, discarded after one firing, is tremendous.

284. Less noisy, bagless vacuum cleaners. The so-called "noiseless" cleaners on the market are not much more than carpet sweepers. Lighter weight would also be beneficial.

285. Non-metallic heating element which will not oxidize or disintegrate in an oxidizing atmosphere and which is capable of reaching a temperature of 1800 degrees C.

286. Selenium Cell development to turn off lights when outside light is strong enough, and turn them on in increasing ratio to maintain a certain light standard. These could be used to automatically dim car headlights when other car approaches; light tail lights when it is dark enough.

287. Non-corrosive storage battery connections, easy to attach and detach.

288.* Lighter weight batteries for pick-up radios to make them truly portable.

289.* Efficient storage battery without a corrosive electrolyte, that requires no attention, for use on automobiles.

290. Electrically operated device for breaking soil in home gardens, preferably a hand tool.

291. Lucite house numbers that can be illuminated by a single bulb. Lucite is a plastic with the unique ability to bend light around corners.

292. Flashlight that will not be internally fouled or corroded if batteries are left in it until they swell with age.

293. Pneumatic hammer that will not shock the operator.

294. A new method of securing lamp shades directly to electric bulbs that will prevent the shades from hanging askew.

295. A high-reaching electric or gas-driven tree pruner for farm use.

296. A cheaper method of making ultraviolet electric bulbs for general germicidal use in the home. They should retail for \$1.00 or less.

297. An electric insect killer that will be less dangerous than those in use at present.

298. A method of electroplating copper, nickel, zinc, cadmium, etc., three times faster than is now possible.

299. A form of insulation for electric wires that can be unwound and that will not peel back when unwinding is stopped.

300. A means of preventing the heat developed in electric lights from flowing to the base.

301. An electric polisher for automobiles that will not have the circular movement which leaves circular mottled pattern effects on the waxed body.

302. A cheap electric paint remover operating on the vibration principle, without a motor.

303. An electromagnetic riveting hammer suitable for home workshop use.

304. An electric broiler working entirely on the principle of heat radiated from proper reflecting surfaces.

305. A means of developing a more positive electrical contact in sensitive relays.

306. A plastic material carrying a conducting ingredient so that electroplating may be done on such surfaces.

307. A street light with two bulbs so arranged that when the filament of one lamp burns out, the second or spare bulb will be placed in the circuit automatically.

Chemical

1. Used vulcanized rubber could be made like new if a system of extracting the phosphorus could be devised. This would make old automobile tires very valuable, since the rubber in them could be restored to a fresh condition and employed in the making of new tires.

2. A method of releasing the energy in atoms.

3. A flexible plaster or plaster substitute which would not show unsightly cracks from the settling of houses on their foundations.

4. Destruction by rust is costing this country millions of dollars yearly but there seems to be no cheap and practical way devised as yet that will effectively prevent it. Either by way of treating metal during its manufacture by the addition of a new ingredient or through the perfection of an absolutely weatherproof preparation for the surface will come the solution of the rust problem.

5. A paint remover that will remove paint rapidly and as fast as the fire method now used by the aid of blow torches. We have numerous paint removers on the market but they do not operate as quickly as most painters desire.

6. A chemical refuse converter for country home use. This would find a use on large estates where the refuse could be converted into useful chemicals for soil treatment.

7. A synthetic insulating material able to withstand the application of very high frequencies and very high voltages.

NOTE: Inventions marked with an asterisk (*) are of especial military importance.

8. A new and cheap chemical fertilizer that can be produced without great installations of elaborate equipment.
9. A synthetic substitute having the same physical and chemical properties as cork.
10. A better method of adjusting electric furnace electrodes for electrothermic and electrochemical processes.
11. Electrolytic cells are now used in the production of many chemical compounds, especially potassium and sodium hydroxide, and further applications should be possible.

matter to supply us with these valuable substances. It is possible to produce our food materials in factories.

16. A catalytic agent for the reactions $\text{CO} + \text{H}_2\text{O} = \text{CO}_2 + \text{H}_2$ that will function below 300 meters.
17. A way of increasing the solubility of H_2 N_2 in water at high pressure.
18. A catalytic agent for the synthetic production of ammonia from nitrogen and hydrogen.

58. Temperature changes and conditions of moisture greatly affect furniture with a mahogany finish. There is a need for a varnish that will not suffer from these changes.

59. Although an attempt is made to keep steel clean during the process of melting, small particles of foreign matter find their way into the furnace and they become encased with the steel on cooling. It is these particles of foreign matter that are responsible for the failure of steel in some cases. A method of keeping steel absolutely clean during the process of melting is needed.

60. Tremendous quantities of grape juice are produced in this country and the problem of the disposal of the pulp used in producing this juice is taxing the chemists. If some means could be found of using this pulp the grape juice industry would be only too glad to adopt it. The problem confronts the great wineries of California and New York.

61. A method of plating pure alumina on other metals.

62. A chemical preparation used to treat leather. Something is needed that will make heavy shoes soft and pliable without losing any of their qualities of resistance.

63. A cheaper method of producing helium from the atmosphere.

64. A chemical preparation that will absolutely prevent the

this substance could be used for the manufacture of chemical utensils.

68. A way of using Kaolin as a refractory.

69. Sewage gases are explosive and some means may be found for collecting them from the sewers of large cities and using the gas for power purposes. This system has been used in England but has not as yet been made economically practical for this country.

70. Cyanogen is a highly poisonous gas and small quantities of it are fatal to human life. Yet cyanogen is extremely useful in many ways. It has been found, for instance, that it produces case hardening in steel. Here, perhaps, is one of its best uses and yet many manufacturers are afraid to employ it because of the Workmen's Compensation Law. A means is needed to make cyanogen harmless for this purpose or to find a substitute gas that will perform the same function.

71. The use of nickel sulphide and black nickel hydrate and nickel chromate as pigments for paint and printing inks.

72. Use of zinc oxide for body colors in ceramic ware.

73. Way of burning lignite under boilers. Lignite is a cheap fuel.

74. Better way of casting ingots from nickel and monel metal.

75. Way of producing copper-nickel metal directly from the

78. The flash light powder now used burns with a heavy percentage of ash which is showered about the room when the powder explodes. Some of the particles are so fine that they remain in the air as smoke and a second picture cannot be taken until the atmosphere is cleared. A flash light powder that will not produce this heavy smoke is needed.
79. A way of making old plaster usable. It might be possible to grind this up and find a binder that would make it possible to use it for cheaper forms of construction.
80. Varnish so elastic that it will not scratch.
81. Prevention of the waste of zinc in the form of vapor oxide during melting in foundries. There is a heavy and costly waste in this which might be prevented.
82. An inexpensive abrasive grain which would have a hardness in the range of the diamond.
83. A varnish or shellac for polishing silver that will make it absolutely tarnish proof.
84. A more simply applied ink eradicator.
85. A chemical to be placed in washing water that will fix the colors of clothes and prevent fading.
86. A substance which added to the chemicals used in producing colored fire will eliminate smoke.
87. An anti-carbon solution to be used in connection with kerosene burners.
88. Toy and novelty manufacturers are very much interested in white enamel that can be used to cover punched steel objects in one dipping.
89. Some substance besides tar or oil that will lay road dust.
90. A chemical substitute for carbon paper or way of producing copies by chemical means.

91. An ink that will dry so rapidly that no blotter will be needed.
92. A waterproof, transparent covering that may be applied to automobile bodies to protect paint.
93. A very cheap solution for the elimination of carbon in motors that will not add over 1/10th of a cent to each gallon of gasoline used.
94. A process for making paper from seaweed and kelp. Some work has been done on this but no practical process has yet been developed.
95. Production of artificial gems in large quantities. This can be done chemically by fusing of certain minerals in the intense heat of an electric arc.
96. The mixing of some kind of a pleasant-smelling solution with gasoline so that the disagreeable odor of the latter will be completely overcome. This would boost its possibilities as a cleansing agent.
97. There is still an opportunity to sell a great quantity of some chemical preparation that will insure freedom from dandruff. Most products now sold merely dissolve the dandruff without preventing it.
98. White enamel is being used to a great extent on kitchen table tops but as yet no one has discovered a solution that will keep the enamel free from stain.
99. When stove polish is applied it scents the house with a very disagreeable odor. A polish that will be odorless is needed.
100. A use for the last by-product of oil refineries. A thick, mucky sludge is left over and this is disposed of with difficulty.
101. A non-toxic substitute for ethyl alcohol for use in flavoring extracts and food products.

102. A substitute for lead paint that will bear up under extreme weather conditions and give as good service as real lead paint will find a ready market. Of course, it must be cheaper than lead paint.

103. Synthetic production of Attar of Roses. This should have an odor as lasting and as strong as the natural article. When it is known that pure Attar of Roses is worth several hundred dollars an ounce some idea of the sales possibilities of a good substitute can be realized.

104. Sawdust is a by-product of planing mills and saw mills and if some cheap method could be found of extracting chemicals like alcohol from it the rights to the patent could be sold to a number of large lumber producers.

105. The water in public swimming pools must be kept in constant circulation and must be continually cleansed and disinfected. The means employed to do this are rather costly and some cheaper way is needed.

106. A universal non-inflammable solvent powerful enough to remove any kind of a stain from any kind of a fabric without injury.

107. A cheaper way of producing metallic sodium from sodium chloride.

108. A spray that will be fatal to the boll weevil which is now destroying the cotton crops of the South.

109. A use for the millions of cocoanut shells that come as a by-product in the manufacture of cocoa butter.

110. Improvement in the cracking process for the production of gasoline.

111. Improved process for extracting radium from pitchblende. This process could be accelerated and the price of radium made cheaper.

112. It is known that X-rays produce different effects upon passing through different chemical compounds and elements. A device might be made whereby automatic chemical analysis could be carried out by the use of these rays.

113. Wines and liquors must be allowed to stand for some time before they take on the right kind of flavor. If this process could be accelerated chemically, millions of dollars would be saved yearly by the producers of liquor.

114. A chemical process for the artificial ageing of wood used in the construction of musical instruments.

115. By transmutation of matter we refer to the changing of one element to another as, for instance, the changing of mercury to gold which was recently accomplished in Germany on a small scale. The gas nitrogen has also been changed to hydrogen. By the use of high voltages and high frequencies it might be possible to disrupt organized matter, robbing it of as many electrons as is necessary for the complete loss of its identity.

116. A cheap fire-proofing paint or solution.

117. Rough determination of the presence of certain chemicals is now made by allowing the electric current to pass through the solution in the large vats of chemical plants. Thus, the conductivity will depend upon how much of the acid, for instance, is present. Using this system it has been possible to construct automatic apparatus for the control of chemical ingredients. It seems that with some research work what would practically amount to an automatic system of analysis might be evolved.

118. Platinum dishes and crucibles are used to a great extent in laboratory analysis because platinum is chemically inert. However, it is too expensive to meet with general application and a substitute is needed.

119. Tar that will not soften in sunlight. If some ingredient could be added that would prevent it from becoming liquid

under reasonable amounts of heat it could be used much more freely on roads.

120. Improvement in the flotation process for the recovery of minerals.

121. Face powder that will be more able to withstand the effects of water.

122. A cheap solution that may be applied wholesale to windows to prevent them from freezing.

123. Rubber that will be proof against the destructive action of the sun's rays. Hot sunlight is the most ruthless destroyer of rubber.

124. A chemical substitute for saponine would be welcomed by manufacturers of soda fountain syrups and other industries using saponine to obtain a creamy, foamy top.

125. If celluloid could be made as transparent as glass and a little more resistant to cracking than it now is it would no doubt be generally adopted for automobiles.

126. Nickel work on automobiles tarnishes very rapidly but if some chemical solution were discovered that would aid in preserving its finish, much of the market lost to chromium plating would be regained.

127. Starch leaves clothes with a rather sour odor and it would seem that there would be a big market for a starch containing a certain amount of pleasant deodorant.

128. A detonating cap that will cause a charge to explode under 3,000 feet of water and crude oil. Of course, the device cannot be prohibitive in cost since it is to be used in oil-well drilling.

129. Method of making white library paste waterproof.

130. New uses for carbon dioxide gas are wanted by the manufacturers of this substance.

131. Chlorine cleaning fluids would be used more by housekeepers if the odor was not unpleasant. A new form of deodorant is needed for these mixtures.

132. A chemical method of treating aluminum kitchen-wear so that it will not oxidize and make the hands dirty when it is handled.

133. A fast-drying liquid wave set for ladies' hair; something that will reduce by at least one-half the time that now has to be spent under driers.

134.* A way to make magnesium from the oxide rather than from the initial salt of magnesium chloride.

135. A chemical combination for candles that will prevent the unpleasant burning odor now experienced. Scents could be added to give the effect of incense.

136. Chemically-treated woods which burn with colored flame have proved popular for fireplace use. Candles similarly treated, at slight added expense, which would burn with green, purple, red or variegated flames would be immensely popular.

137. The perfect anesthetic yet remains to be discovered. One which will completely eliminate pain without removing consciousness is needed for many medical operations in which the assistance of the patient is desired, as in childbirth. It should, of course, be absolutely free of after-effects and not subject to danger from explosion, as is the case with some gas anesthetics.

138. An organic nickel or cobalt compound soluble in gasoline and stable in the presence of water and aminophenol.

139. Housewives do not like to pour bacon grease down the kitchen drain because it is likely to clog the pipes. A reservoir of solvent which would keep the grease in a liquid state until it reaches the sewer, requiring no attention, would find favor.

140. The hardest building stone disintegrates in time owing to corrosive acids contained in the atmosphere of cities. A cheap

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2100 NEEDED INVENTIONS

and permanent solution applied to stone during the process of construction would solve this problem of the building industry.

141. A substance which, added to baked goods, would prevent

CHEMICAL

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149. A chemical process to render wool knit goods absolutely shrink-proof without harm to the fiber.

150. A chemical application on rayon knit goods imparting run-

[152]

2100 NEEDED INVENTIONS

150. A selective solvent for hair with but minor effect upon the

CHEMICAL

[153]

76. A cheap non-corrosive anti-fusene for use in chemicals of

182. The rubber industry needs an anti-oxident which would not discolor white and light colored stocks.
183. A non-inflammable arc-quenching liquid having the electrical insulating property of transil oil, which does not decompose and liberate noxious or corrosive vapors.
184. A means of purifying talc to remove iron oxide.
185. There is a tremendous consumption of paraffin in the manufacture of bread wrappers, carton wrapping papers, etc. If a product could be developed which would afford greater moisture-proofness than paraffin, afford a surface that would be harder so that it would not have that greasy feel, and would not collect dust like paraffin, it would have a large market in the packaging industry.
186. An American source of tartaric acid for use in foods.
187. We are making gypsum with a compressive strength up to 10,000 pounds per square inch and a water absorption in twenty-four hours as low as five per cent, but we need a permanent integral waterproofing that will not interfere with the compressive or tensile strength, nor the time of set.
188. Dry ice is now being used in a very limited way because no means have been found to properly control it. If properly controlled, it would be invaluable for use in railroad cars, trucks, small show cases where refrigeration is impractical, delivery cases, and many other instances where a reliable refrigeration is necessary, but where mechanical means of ice becomes too cumbersome.
189. Liquids of varying specific gravities from 1 to 50 for use instead of oil, water, and mercury in flow meters, level gauges, and similar equipment.
190. A new method of preparing fluorine. The present method of preparing the gas by electrolysis of a solution of potassium fluoride in anhydrous hydrogen fluoride is difficult and costly.

191. A substitute for nickel as a catalyst in the hydrogenation of vegetable oils.
192. An ingredient for putty that will prevent it from shrinking and drying out.
193. Mass production methods for inexpensive manufacture of indestructible playing cards.
194. A plastic material that will have exactly the same refractive index as glass and that will be as cheap as glass to make.
195. Ink for toy printing presses that will readily wash off hands and fabrics.
196. A polishing material for metals containing no abrasive material of any kind.
197. A new preservative for telephone poles that will double the life of the portion buried underground.
198. Some metals may now be polished with current in an electrochemical bath. A home outfit for cleaning silver, based on this principle, would be welcomed by thousands of housewives.
- 199.* A form of explosive that positively will not be set off except by a detonating cap.
200. Some sort of liquid preparation that can be painted on the bottoms of shoe soles to prevent the wearer from slipping. Should give perfect traction regardless of weather conditions and one application should be good for a full day.
201. A kerosene lamp that will burn without odor.
202. A spongelike plastic material that will replace cork.
203. Linoleum cement that can be easily removed from floors, or that will respond better than present types to ordinary solvents.

204. Ink for fountain pen and desk use that will dry practically the instant it flows from the pen point, making smudges and blotters unnecessary.

205. The motor industry still waits for a solvent that can be added to gasoline and that will positively remove carbon without damaging metal parts of the engine.

206. A true plastic powder which when mixed with water or other common solvent can take the place of the many so-called plastic woods now sold.

207. The greatest need in industry is the purification of trade waste. Here is a "group" or government problem whose solution would lead to better health conditions for the public, as well as aiding industry. The problem faces sulphite and kraft pulp mills, beet sugar plants, fruit and vegetable canneries, fish plants, wineries, wool scouring plants and distilleries. These wastes are high in organic impurities which putrefy and contaminate the waters into which they are delivered.

Aviation and Automotive

1. An easily managed airplane that can be caused to function with fewer controls and with greater accuracy.

2.* Some way of reducing the airplane's noise without affecting the power of the motor used. It would seem that some way of introducing interfering sound waves that would effectively counterbalance, so to speak, the heavy vibrations produced by the engine might be devised.

3. Airplane motors are exceedingly inefficient especially in their horsepower to unit of weight ratio. It is claimed that the airplane will advance very slowly until some inventor produces an engine that will deliver to the crankshaft one horsepower for every pound of weight. This means that a 400-lb. engine suitable for a light plane should produce 400 H.P.

4. Better automatic electric signals for street intersections.

5. Some means of reducing the "slip" of airplane propellers.

6. There still remains a dangerous blind spot in the left rear quarter of closed cars, where rear-vision mirrors are unable to warn the driver of a passing car until it is upon him.

7. An absolute altimeter that will not only tell the pilot how high he is above the ground, but also of looming objects such as mountains several miles ahead.

8. Airplane wings with changing areas. A wing is needed the area of which the pilot will be able to change from his seat. For

NOTE: Inventions marked with an asterisk (*) are of especial military importance.

instance, an airplane going at high speed does not need the wing surface it needs going at lower speeds and the added wing surface only reduces speed.

9.* A method of landing airplanes on a small space. Also a method of taking off from a small space.

10. Governments of the world are still interested in a helicopter or an airplane that will travel straight up and horizontally at the same time without danger.

11. A speedometer attachment which would record speeds on paper or other medium in case of argument with traffic officers.

12. A tire that will have all the advantages of the pneumatic tires now used but that will not use rubber, and which will not be air-inflated, thus eliminating blowout and puncture difficulties.

13. An airplane capable of landing at low speed (20 m.p.h.) without sacrifice of speed performance when in flight.

14. A safer parachute that will open without fail.

15. A great deal of trouble is had with airplane spark plugs due to the breakage and leakage. A better spark plug able to withstand the high pressures and high temperatures used is needed.

16. A better airplane compass unaffected by the electrical apparatus carried.

17. A simple and more effective method of marking national highways so that it will be practically impossible for motorists to become lost.

18.* A plastic airplane in which the entire body and wings, or large sections of them, could be molded swiftly or stamped out after the speedy manner of automobile bodies.

19. The reciprocating gasoline engine of the present is highly inefficient and there is needed in its place something like the gasoline turbine or non-reciprocating power producer.

20. An automobile headlight that would actually have fog-penetrating power would be a winner. Many of the yellow-lens "fog lamps" sold to motorists do not penetrate mists any more efficiently than ordinary "white" light.

21. A substitute for tire chains. Something that will not cut into the tires and will not break.

22. A better method of calling chauffeurs at public institutions, such as large department stores, etc.

23. An inconspicuous mirror attachment which will reflect overhead traffic signals to the driver, and yet will be so designed as not to clash with the lines of the car.

24. A simple alarm for soft tires.

25. Some method of precipitating exhaust smoke so that it will not reach the street. This might be done electrically by the Cottrell process.

26. An improved bumper that will not bend when it strikes.

27. Brake lining that will not burn.

28. Cheaper type of car heater run from exhaust gases.

29. Wind shield wiper that will not move in front of the operator's face. An entirely new method of keeping water from the wind shield.

30. An airship built on the vacuum principle. If the air from a ball, for instance, light and strong enough, could be withdrawn the ball would float in the air in much the same way that a piece of wood floats in water.

31. Method of preventing radiators from freezing in cold weather.

32. An entirely new cooling system for use on automobiles. This should not make use of either the radiator or air cooling.

33. Improvements in air cooled motors so that they will operate at higher temperatures.
34. A fuel economy made by the use of suitable variable speed transmission. To give engine better load factor of a modified Diesel cycle to prevent the use of heavy liquid fuels.
35. A garage machine for the rapid straightening and aligning of wheels.
36. A way of preventing the formation of carbon in cylinders without the use of a liquid agency.
37. The development of a low cost and practical air-conditioning system for automobiles.
38. Fenders that will not become easily bent and that may be easily straightened when bent. It seems that some new kind of material should be developed for use as mudguards.
39. A sure-fire method for starting cold motors in the winter time.
40. A water circulation system in automobiles that cannot become plugged in any way.
41. A wiring system of a fool-proof nature that will overcome short circuits.
42. Camping equipment that will be easily folded and that will save space and weight.
43. An absolutely indestructible paint for automobiles unaffected by water and snow.
44. An automobile polish that will impart a semi-permanent lustre, one application lasting for two or three years.
45. A new kind of traffic system with lights for municipal use.
46. A method of constructing an automobile that will be rattle-proof.

47. Improvement in six-wheel buses.
48. A better lubricating system that will carry oil to all parts of the car from one central location.
49. Storage batteries are constantly in need of distilled water to replace the water that has evaporated. If this water could be automatically admitted from a reservoir on the battery itself time and trouble would be saved.
50. A thief-proof automobile tire lock, securing the tire on the wheel and the wheel on the car.
51. A better way of anchoring automobile door hinges so that they will not become loose.
52. A "mud hook" for quick application around a tire, which will fit the modern type of disk wheel.
53. A car washing machine which will reduce the time and effort in car cleaning.
54. A special straightening tool for mudguards for the home mechanic.
55. A brake lining that can be resurfaced and used again.
56. A substitute for hard rubber tires on trucks.
57. A paint or chemical preparation used to prevent rusting of wire wheels. Graphite preparations have been tried but they have not been wholly successful.
58. A way of preventing the valve tappets from making noise.
59. A magnetic gear shift operated from the storage battery plant of the car.
60. Mufflers are often punctured by the explosion of gases that accumulate within them. Puncture-proof mufflers are needed.
61. Many accidents have been caused by too much play in steering wheels. This play must be taken out and considerable

trouble is necessary to do it. If some steering wheel with an automatic take up could be invented it would be adopted by the automobile people.

62. The elimination of the problem of burned valves and the maintenance of valve seats is one of the biggest problems of the automobile industry.

63. A means of producing puncture-proof tires by inserting some kind of a metallic fabric between the surface and the inner tube.

64. New way of illuminating instruments on the dash that will not tend to interfere with the operation of the car.

65. Non-chemical way of eliminating carbon.

66. A dash instrument that will instantly tell when the car is hitting on all cylinders, or which ones are missing fire. This can be very easily perfected.

67. Many airplane accidents are caused by failure of the motor. If some kind of an auxiliary motor or engine capable of developing 200 H.P. for 15 minutes could be perfected, many lives would be saved.

68. An automatic magnetic gear changer that will shift gears when the car reaches the necessary speed. The gears should also be able to work backward so it would be able to slip from third to second when the car slows down.

69. Roll curtains that will be out of sight when not needed.

70. Numerous accidents are caused by wheels coming off. A wheel that cannot come off is needed.

71. A simplified universal wheel puller that can be used for wire, wood or disc wheels.

72. A simple device that will allow an auto mechanic to tip a car on its side so he may work on the bottom while standing

normally. Such a thing was developed once but it was not commercially successful due to a matter of design.

73. A four-wheel brake system is about one step closer to the four-wheel drive which means that the engine will be connected to the four wheels.

74. Ash receivers in automobiles that will never need emptying. The ashes and butts should be carried by conduit to the bottom of the car where they could be deposited on the street.

75. A more rapid dumping body for heavy trucks.

76. A non-leaking connection between radiator and engine. The usual rubber hose used for this purpose seems to be a constant source of trouble.

77.* There is a great need for more reliable aviation instruments. The ordinary compass has proven unsatisfactory and the gyroscope compass is not light enough for this purpose. There is an opportunity here for inventors who know something about aviation. The United States army is particularly interested in this.

78.* Ignition of airplane engines is a most promising field for experimental investigation. Owing to the fact that modern engines develop explosion pressures of from 400 lbs. to 600 lbs. per square inch (28 kg. to 42 kg. per sq. cm.) and a mean effective pressure of 120 lbs. to 135 lbs. (8.4 kg. to 9.4 kg.) the problem of spark plugs is a difficult one. The insulation must be capable of withstanding the enormous temperatures developed, and the plug must not leak. A slight leak past the insulation for a period of thirty minutes would cause complete failure of the plug. The spark points of the plugs must be maintained at a sufficiently high temperature to prevent an accumulation of carbon on them, and yet their temperature must not be high enough to cause pre-ignition of the combustible charge. This means that the spark points must be maintained within a critical temperature zone. The chief trouble encountered with spark

plugs up to date has been that at low engine power the temperature of the spark points is so low that the points rapidly become carbonized and the plug is short-circuited. This carbonizing can be corrected by a better system of lubrication. Heating and expansion of the insulated electrode tend to cause the insulator to fail by cracking or otherwise and the fact that all good electrical insulators are poor conductors of heat makes it difficult to keep the temperature of the insulator down and to protect it from injury by overheating. References to this subject may be looked up in the Journal of the Society of Automotive Engineers under the headings of "Ignition" and "Spark Plugs."—*Bureau of Aircraft Production, War Department, Washington, D. C.*

79. A motorless airplane or glider that can be propelled by the feet alone.

80. A non-fouling spark plug.

81. A spark plug made without the use of porcelain or any other material that will fracture.

82. A more comfortable, lighter, and more easily folded sleeping bunk for airplane travel.

83. A system of parking a car that will prevent the rear wheel scuffing the curb. Perhaps a series of mirrors giving vision to the driver would prevent this.

84. A valve seating tool that will be automatic in its operation and that will not over-cut the seat.

85. A tail light for an automobile that will constantly flicker. This action would greatly increase the visibility of such lights.

86. An automobile chain in which broken links could be very easily replaced without the use of tools.

87. A ditch-digging attachment for ordinary farm tractors.

88. A new form of luggage carrier for automobiles that will not take up space on the running board is badly needed.

89. A method of using the heat from the exhaust gases of an automobile in helping to drive the car.

90. A folding-wing civilian airplane that will be perfectly safe and that can be built as cheaply as the present designs.

91. A cheap anti-freeze solution that will not corrode, that will not have to be removed in summer and that will not have any odor. It should also be able to completely resist evaporation.

92. A summer screen for automobile windows that can be lowered into the doors and body of the car.

93. The modern stream-lined automobile has greatly interfered with the natural ventilation received by the brakes in the old style cars. Hence there is needed either a cooling device for brakes or else a chemically treated lining that will not heat up.

94. A method of manufacturing a pneumatic tire that will greatly increase its traction (ability to resist skidding) without greatly increasing its cost.

95. An automobile jack with a large folding base that would entirely prevent tipping when in use would be a very popular number with motorists.

96. A finish for automobiles that will enable the car owner to refinish body scratches in a few minutes' time and with professional appearance.

97. A combination tire valve and pressure gauge that would show amount of air in the tire would be popular with motorists if it were cheap enough.

98. A simple little alarm for gas tanks that would warn the driver that his fuel supply was low would make a big appeal to many car owners.

99. A small article that will sell for a dime and that can be used to prevent rattles in the windows of old cars.

100. Some method of saving the paint on the hood of an automobile from the excessive heat produced by the manifold of the engine.

101. Motorcycles are dangerous to drive on wet pavements due to the back wheel which skids very easily. Some method of traction or skid protection is necessary.

102. A license plate holder for automobiles that would require no tools for the placement of the plate and yet that would prevent the easy theft of the plate.

103. A cheap viscosity meter on the panel of a car that would tell the motorist when to change his oil would be a most helpful device.

104. A number of serious accidents have been caused when the couplers between automobiles and trailers have broken. A better coupler is urgently needed.

105. A windshield wiper operated from an electric solenoid instead of the vacuum system or motor would be far more reliable.

106. Service men have trouble with lubricating oil in the colder weather for the reason that it flows very slowly when chilled. Hence we need a dispensing container that will force the oil forth at high speed and at the same time whip the walls of the container clean.

107. There is still need for some sort of a device on the front of automobiles that will prevent serious accidents when people are struck. If the right kind of an article appeared a law would be passed making the use of the device mandatory.

108. An automatic tire gauge that will by-pass excessive pressure and that could be adjusted would be a big winner.

109. An automobile heater that will permit more heat to reach the back of the car either by direct conduction or by better forced draft.

110. A more economical method of taking the heat from the manifold of a car and converting it into steam heat for the heating of cars.

111. The development and protection of a rear-engine automobile would be a major advancement in the industry.

112. An automobile stop light at the rear of the car in the form of a projector that would throw the word "stop" on the pavement would help to prevent accidents.

113. A simple meter for the dashboards of automobiles that would register the number of miles for each gallon of gas consumed would be welcomed by every motorist interested in economy.

114. The red rays of neon lamps penetrate fog much better than any other form of illumination. If such a lamp could be cheaply applied to the tail lights of automobiles, a wide and lucrative market would be opened up.

115. A method of keeping ice from forming under the mudguards of automobiles.

116. An accident-proof stratosphere plane.

117. A simple means of converting gasoline engines into Diesel engines.

118. A device to be used on an automobile that will distill the gasoline out of crude oil.

119. An automobile door that will never rattle.

120. An automatic door in which it would be impossible to catch the fingers.

121. An airplane that will land in a small space.

122. A real captive monoplane for use in amusement parks.

123. A new and cheap method of keeping a motor warm all night in a cold garage.

- 124. A self-cleaning filter for a carburetor.
- 125. A self-cleaning oil filter for automobiles.
- 126. A leak-proof and self-healing automobile radiator.
- 127. A method of making automobile radiators of aluminum which conducts heat faster than brass.
- 128. A really noiseless automobile heater.
- 129. Body designers are striking out along daring new lines and one of these days some clever fellow will come along with a design for autoseats which will permit them to be shifted about at the will of the user, like furniture in a living room.
- 130. A method of producing timing in automobiles that will prevent motor trouble from this source for the entire life of the car.
- 131. A new gas station design that will permit the free passage of cars in a very small space so that stations may be placed on crowded main streets where high property costs would not permit the station of ordinary size. A series of moving platforms might solve the problem.
- 132. Automobile doors that cannot be opened while the car is in motion.
- 133. A car which could be sold for \$200 and simply be "transportation." This is not an individual new product, but a collective development. Today the salesman has too much to say about the designing of automobiles. Automobiles should be more functional.
- 134. A rubber composition mudguard that can be bent without breaking and that will carry a finish.
- 135. If a device could be developed that would stop an automobile from skidding the instant that the car starts to get out of line, it would prevent a vast number of accidents.

- 136. A device on the rear of an automobile for making tire changing easy and not a dirty, awkward and complicated task.
- 137. Research, properly directed, could remove the menace of carbon monoxide generated by the automobile through the use of a suitable catalyst or some modification of the cycle or mechanics of the engine.
- 138.* A procedure for dispelling fogs locally over airports.
- 139.* Material to which ice would not adhere, for use on airplane wings, highway surfaces, windshields, etc.
- 140.* Improvements in methods of aircraft construction such as flush riveting or spot welding to achieve absolutely smooth external surfaces without introducing serious maintenance problems.
- 141. Lightweight, low cost accessories for aircraft engines, such as fuel pumps, ignition apparatus, starters, and carburetors. If we did not have to spend so much on accessories, we could put out a low cost engine of 100 H.P. that might satisfy a large demand.
- 142. An airship of the gyration type that would land on top of a flat-roofed building, or a small, circumscribed space. When a small, inexpensive machine of this type is developed, it will relieve the dwelling house congestion by scattering the population to suburban districts.
- 143. A means of mounting parking meters that will not require breaking holes through concrete sidewalks.
- 144. An automobile horn that will not lose its tone through adjustment.

Machines and Mechanical

1. An anti-friction metal containing graphite or some other finely divided lubricant that will stand up in service for small moving parts without lubrication is a commercial need of the day. The material should be easily machined and should possess considerable mechanical strength.
2. Improvements in roller bearings that will prevent wear and reduce friction are needed.
3. In the machine industry special drilling jigs must be made for each part in quantity production and since these jigs are costly and cannot be used again should the design of the part be changed a great annoyance to factory managers results. An automatic jig that will have few parts and that can be instantly changed is a badly needed invention. The jigs would have to come in various sizes and accommodations would have to be made for the easy insertion and extraction of various sized bushings.
4. The scleroscope is an instrument used today for testing the hardness of materials. There is also another device used in the Brindell test for hardness of metal. Neither one of these devices, however, appears to meet the engineering needs of the day and the Mechanical Engineering Society of Great Britain in recognition of this need have offered a very substantial reward for the development of a practical hardness testing machine. In one of the tests used today a steel ball of known hardness is dropped on

NOTE: Inventions marked with an asterisk (*) are of especial military importance.

the metal surface and the amount of rebound is taken as an indication of the hardness of the metal. However, this is little more than a rough estimation and it has by no means been accepted as a thoroughly scientific test.

5. Coal in coal mines is handled largely by electric locomotives and by mules. If some system of automatic conveying could be developed that would bring the coal out of the mine in a constant stream and as fast as it is produced by the miners, considerable saving in time and money would result. The conveyor should be of a portable type so that it could be moved as mining progressed.
6. Another mechanical problem of conveying apparatus is that of producing a conveyor of any form, bucket or screw, that will be able to handle ashes without suffering from the abrasive properties of the ashes. Conveyors are used little for this purpose today because the ashes grind them to pieces in no time and the money that might be saved in handling this way is lost in the rapid depreciation of the equipment. The need is for an ash-proof handling system.
7. The rapid production of small parts is now made possible by die casting machinery where the mould is in metal form instead of sand. Die casting is usually done with light brasses or what is known as white metal. There is a need for a system that will produce the metals of higher melting points in the same way. For instance, cast iron. So many parts are produced in iron that there would be a big demand for die cast iron.
8. Cheap anti-friction bearings of the non-roller type are needed for all types of machinery of the heavy variety.
9. A simple mechanical problem of great promise is that of devising a wave motor that will make possible the utilization of tide power.
10. A typewriter operating on the same principle as the typewriters of today and yet incapable of producing the nerve-racking noises produced by the present machines would find a wide

sale. The noiseless typewriter of today operates on a different principle and the difficulty of making carbon copies prevents its more extended use.

11. A purely mechanical spark arrester that would eliminate the danger of fires where locomotives pass close to buildings would be adopted by many railroads.

12. Where large dies are used on punch presses cutting sheet metal it is necessary to apply the lubrication to the metal to prevent the dulling of the die. If some attachment could be developed whereby the process of lubrication would be automatic when the die head descended the device resulting could be introduced into several thousand shops in this country.

13. Machinery for the production of stone relatively free of slabby elongated pieces.

14. Economical methods and apparatus for the concentration of lean iron ores.

15. The sprockets on motion picture machines engage the perforations of the film and in this way the pictures are drawn before the shutter. Contrary to what might be expected, celluloid is a very hard substance and capable of producing considerable abrasion even against metal. As a result of its abrasive action the sprocket wheels of motion picture machines have to be changed often at considerable expense. If a sprocket wheel could be produced that would overcome this tendency, moving picture theatres would be saved considerable operating costs. When the present wheels become a trifle worn the picture flutters and they are unsuitable for further use.

16. Although grinding wheels are tested before they leave the factory where they are made, accidents often happen to them in transit and numerous cases are on record where they have burst while revolving at high speed, killing men. A grinding machine that will prevent the flying of these pieces, or a wheel that will

not burst would be welcomed by the factories using them for the simple reason that it would reduce workmen's compensation insurance to a considerable extent.

17.* Aluminum, owing to its peculiar molecular construction, is very difficult to drill with ordinary metal drills. The metal clogs up the flutes of the drill which causes it to drill oversize holes. What is needed is a special drill for aluminum that will meet the peculiar requirements of the metal.

18. Aluminum is a difficult metal to work in other ways. Particles of the metal lodge in the surface of grinding wheels and render them partially inefficient. Some special form of grinding wheel that will not permit aluminum particles to lodge in its surface is needed.

19.* Were it not for the fact that the lubricating oil in machinery chills and congeals, factories would not have to be kept heated to normal temperature during inactive hours, and considerable quantities of coal, in the case of large establishments, could be saved. This problem is not impossible to solve; if some sort of a padded bearing that would prevent oil from chilling could be developed it might solve the problem.

20. Great losses to power result from the slipping of leather belts and although certain preparations have been made to prevent this slippage none of them is entirely satisfactory, hence a non-slipping belt would be a distinct improvement.

21. It is practically impossible to drill a straight hole with an ordinary hand drill. Levels have been attached to drills of this nature but they are so sensitive to maintain that they are practically useless. A simple little attachment that will permit a home mechanic or a mechanic working without the aid of a power drill to keep the drill travelling in a straight course would stand a good chance of making its inventor a good deal of money.

22. More efficient propellers in hydraulic pumps is a mechanical problem of some importance.

23. A centrifugal pump giving equal pressure at all heads.
24. Here is a general problem that has to do with the replacement of castings by pressed metal parts produced on punch presses. The Ford automobile is a good example of what has been done with pressed metal to replace expensive castings and yet obtain a desired degree of strength and rigidity.
25. Machine shops are constantly bothered with castings that have large sand holes in them. This is caused by a falling away of the sand in the mould at the foundry. However, when a drill strikes into a hole of this nature in cast iron it usually breaks and the casting is invariably scrapped due to the impossibility of withdrawing the broken drill. Some method of overcoming this trouble is a problem, indeed.
26. In heavy machinery like that in steam generating plants, vibration is an important factor, since a vibrating part is a serious menace to the machinery in general. A knock or vibration is not always easy to find although its remedy would be a simple matter once it is located. A vibration detector of some sort (perhaps electrical) might in some cases save thousands of dollars' damage to expensive machinery by instantly locating any imperfections.
27. Improvements that will make for accuracy and speed in mechanical measuring instruments.
28. The compression chuck is very valuable for certain work and were it not for the fact that various-sized bushings must be employed it might meet with wider use. The development of a universal chuck of the compression type would be encouraged by factory managers.
29. It has been found that excessive noise in factories makes for inefficiency and anti-noise machinery of any kind is one of the needs of the day.
30. A compensating gear wheel that will avoid rattling by taking up the wear on the other gears in the train.

31. Extra hard steel such as that used for tool cutters is exceptionally brittle and consequently breaks when subjected to mechanical strain. A real hard steel that will be tough enough to overcome severe mechanical stresses is possible and would be highly practical.
32. Although the insurance companies have insisted upon certain safety measures in connection with punch presses there is still a need for an automatic guard that will prevent the maiming of operators.
33. Automatic screw machines are in wide use today and if some simple detector of inaccuracy in turning could be developed that would automatically stop the machine when it lost its adjustment it would make the device a great deal more practical.
34. A tool that would extract broken drills and taps, thereby making it possible to save expensive castings from the scrap-heap.
35. When small metal parts are stamped out they are usually covered with lubricating oil and a small machine that would remove this, leaving a bright finish on the metal, is needed. The machine should be inexpensive and the process involved should be simple so that practically no cost would be added to production.
36. Odd-shaped pieces cannot be handled by the jaws of an ordinary vise. If some sort of a universal jaw could be produced vises would be much more useful to mechanics than they are now.
37. An unbreakable hacksaw blade can be produced by some means of attaching the hard metal necessary for the teeth to a tougher strip that will not break as easily as the blades do when mistreated even slightly.
38. Hacksaw blades are rather expensive and a simple machine that would work automatically in resharpener them at a small cost would reduce operating expenses in many factories.

39. Screw driver handles and the wooden handles of other small tools are in the habit of loosening and coming off. A method of anchoring a tool in a wooden handle so that it will stay put throughout the life of the tool is something to work on.
40. The file handle presents a little different problem for removable handles have been made because a file usually wears out before the handle. However, these handles do not stay put as they should and often split even before the file has served its full life of usefulness.
41. A cheap system of automatic factory lubrication would find practically universal application, providing it could be installed for a sufficiently small sum of money. The cost would have to be based on the amount of salary received by oilers.
42. A simple ash conveyor for home use that would lift the ashes from the cellar and deposit them in a receptacle on the ground level would be a very popular device with those who take care of their own furnaces.
43. An electric alarm that will function when the cutting tools on automatic screw machines are producing oversize or undersize parts.
44. A special chuck that will hold broken drills so that the duds in large factories can be put to some use. They could be used for inaccurate work providing a method of holding them could be found.
45. Broaching is today a tedious and costly process and rapid production is impossible. A new kind of high speed broaching machine would be welcomed by factory managers.
46. The wearing of lathe bearings is fatal to the accuracy of the tool and for this reason there is an opportunity to develop a system of bearings that will automatically adjust themselves to take up wear.
47. A way of increasing the accuracy of lathes without increasing the cost of production.

48. Steel measuring blocks of high accuracy are now used a great deal by the inspection department of large manufacturers. These blocks are very costly because of the tremendous difficulty in bringing them to a high degree of accuracy. A cheaper way of bringing this accuracy would be a very profitable process to patent.
49. Wrenches will slip and as long as they slip people will lose flesh from their knuckles and mechanics will be driven to the use of profanity. A monkey wrench that will be guaranteed against slipping would be much in demand.
50. Some attempts have been made toward automatic buffing machinery but there is still plenty of opportunity for the ingenious inventor to apply his mind.
51. The smaller drills (between 50 and 60) are sharpened only with great difficulty on large grind stones. This is because of their tiny size. If some little pocket grinding device could be made the factory operators using such drills could sharpen them without depending upon the crude emery wheel. The device should be automatic insofar as the production of two uniform cutting edges is involved.
52. A variable speed drill press that will get away from the friction discs and belt pulleys is a needed invention of some importance.
53. Filing machines on the market today are perfectly feasible for certain objects but in the matter of odd shapes little can be done. A filing machine that will be able to handle irregular shapes is needed.
54. The cleaning up of castings by filing and grinding is an expensive item in the production of machines for this is all hard work. If some system could be devised that would speed up this process a labor saving of great merit would result.
55. A magnetic chuck for rapid production lathes would save a great deal of time in lathe operation.

56. The cutters from milling machines must receive constant attention in the way of sharpening and this is a laborious, costly process. An automatic sharpening machine that will produce uniform results is something to think about for inventors with strictly mechanical tendencies.

57. A device for sharpening a circular saw without removal from the spindle.

58. A tin cutter for use in the manufacture of cans that will cut without leaving a raw edge.

59. A method of reducing or entirely eliminating the noise produced by gears.

60. A new road-making machine that will spread and roll black-top at the same time.

61. A small metal cover that can be slipped over the end of a chisel so that it can be placed in a tool box without danger of being nicked. These little articles would have to sell for five cents each and they would have to be designed in such a way as to hold in position.

62. A little gadget to be attached to the bottom of a plane that would permit the accurate duplication of bevelled edges would be bought by every carpenter in the United States if not in the whole world.

63. An attachment for a three-jawed lathe chuck that will permit it to hold a square rod.

64. A magazine hammer that will automatically supply a single tack at each blow.

65. A machine that will grind and sharpen dies without removing them from punch presses. A similar sharpening device would be welcomed by printers using guillotine paper cutters.

66. A simple little home scissors sharpener that could be sold for a quarter and that would sharpen the blades at just the right cutting angles would be bought by many women.

67. A special bit that would permit carpenters and home mechanics to drill square holes of any size would easily make a million dollars within a period of ten years.

68. A pair of pincers in which the skin of the hand cannot be caught would be welcomed by mechanics who have had this experience.

69. A practical design for an all-metal shovel including the handle would win a big following.

70. A pressed metal, detachable file handle that would provide a comfortable grip would engage the attention of millions of mechanics.

71. A carpenter's plane that will have a calibrated dial to indicate the setting of the cutting edge of the blade.

72. A four- or six-jawed vise that will firmly hold odd-shaped articles would be purchased by the large manufacturers.

73. Hacksaws now expand in only one direction. There is needed a cheap hacksaw frame that can be adjusted upward so that it can accommodate deeper cuts.

74. A carpenter's plane that will be so constructed as to prevent shavings from becoming clogged between the blade and the body of the tool.

75. A saw that would remove the sawdust from a board as it cuts would permit carpenters and mechanics to follow the line much more easily.

76. Eliminate the need for four or five different types of dough handling machines and replace them by a single machine which would mix, permit the dough to rise, shape, apportion, and place in oven.

77. An automatic mechanical valve clearance regulator for adjusting the clearance between tappets and valves in automobile and aircraft motors.

78. Alternating current motor with the simplicity of a squirrel cage, having at all speeds the torques and efficiencies of a direct current motor.

79. In present power looms for weaving and knitting, all runs must be stopped in order to tie-in warps or broken ends of yarn. Machines in which one run could be stopped at a time would furnish a great advance.

80. What the textile industry needs is a loom which will run with much less noise. The principle of the present loom has not changed for a century.

81. A better machine method of dyeing as applied to both ordinary and fast colors. The continuous machine method is only applicable to large runs whereas the demand average is only about 300 yards per shade.

82. Development of a mechanical system to permit more uniform preparation of silver and more uniform spinning of yarn from hard cordage fibers such as manila, abaca and sisal used in twines and ropes.

83. If a machine could be devised which would cut out the knots and defects, and glue or literally weld the remaining pieces of clear lumber together into an endless board, the benefits to the industry are unpredictable.

84. Machinery whereby a whole log could be sawed by a gang saw, without having to go first to a circular.

85. Machine to assemble plywood panels now assembled by hand.

86. A mechanical device for counting, sorting and removing imperfect sheets of paper in the finishing room. This now involves a large amount of labor.

87. Means of transporting glass to lehrs, now done by the expensive method of carry-in boys carrying one glass on a forked stick 50 or 60 feet.

88. A machine to remove rust from pipes and structural shapes in tanneries before painting. The rust drops in the tanning liquors and causes iron stains.

89. A mechanical device for flaying or taking off hides. There are millions of dollars lost each year by scoring caused by skinners' knives.

90. A filter or separator to separate insolubles from tanning liquors.

91. Counter-current washing equipment for use in manufacturing skin leather.

92. Efficient machine for packing small tobacco packages and affixing Internal Revenue Stamps. Present machines were developed fifty years ago.

93. Automatic packing machinery for square crackers such as soda crackers.

94. A method of pitting cling peaches. There are several devices on the market, but their operation is crude and wasteful.

95. A gas-fired deep fat fryer designed for high efficiency without producing excessive grease temperatures.

96. The piston ring industry needs a molding machine for making piston ring castings into which sand could be blown with the operator merely putting on and taking off the flasks when filled.

97. An efficient method of centrifugally casting thin wall sleeves within .010 for roundness and straightness, as well as uniform wall thickness for use as dry insert cylinder sleeves for internal combustion engines. This would permit hardening of the sleeves before grinding and honing. It would have a very wide market.

98. A loose pulley with built-in clutch, with high torque capacity and small dimensions, so designed that it would retain its lubricant.

99. A practical method of fastening tungsten carbide tools to barrel drills.
100. Machine for grinding small radii on cutters of various diameters.
101. Differential producer that would give a differential varying directly as the flow instead of as the square of the flow.
102. An automatic grinding or sizing machine to make burned clay products.
103. The nozzle on the sand blast machine used for cleaning castings needs constant replacement. A rubber-lined nozzle might give better results.
104. An abrasive blasting grain nozzle which can be produced as readily as the present manganese steel nozzles. Nozzles produced from alloys containing boron carbide or tungsten carbide are not economical.
105. A full opening valve which will close completely under any condition.
106. An internal combustion engine to operate on the principle of a turbine.
107. An internal combustion turbine which would make possible the flexibility of steam in oil field operations without the immobility of steam boilers and the problem of boiler water.
108. An internal combustion engine working upon the Diesel principle to use alcohol.
109. Small scale Diesel plants for house lighting and passenger automobiles would open new fields with advantages in economy and maintenance.
110. Diesel engines for stationary and marine use in sizes ranging up to 1000 horsepower, to cost not more than \$15.00 per horsepower.

111. A very wide field exists for the development of the hydraulic method of transmitting power for large units such as rolling mills.
112. A rotary hydraulic pump, somewhat on the principle of the Hele-Shaw Pump, but not limited to 1200-1500 pounds per square inch.
113. A pump suitable for ultra-deep oil wells, not subject to the limitations common to present day pumping equipment.
- 114.* In stratosphere flying, a fuel system is badly needed which will compensate for the drop in pressure at high altitudes. Vapor lock is now a great trouble due to the drop in barometric pressure with altitude.
115. A brick machine to pug and temper raw materials for the stiff mud process of brick making that will extrude same in the proper form without the folds or laminations that are now encountered.
116. A vacuum cleaner especially adapted to the cleaning of floors, ceilings, and machinery of flour mills.
117. Accurate means of balancing armatures and fans used in vacuum cleaners, both dynamically and statically.
- 118.* Tools for welding structural steel in the field. While welding is now pretty general in shop practice, it is expensive on location jobs.
119. A rivet to be driven in from one side without requiring accessibility from the other side for use on airships.
120. Process for drilling through "heaving shale" which is earth strata having the ability to "heave" or flow into the hole being drilled for oil.
- 121.* Boilers which will not accumulate slag.

- 122. An oilless bearing for use in the textile industry that will not get clogged up, nor dirt the yarn with which it comes in contact.
- 123. A practical barrel unit for chromium plating.
- 124. A system of gear teeth in which small departures from theoretical shape will have a minimum of effect on noise, particularly in high-speed, small-size gearing.
- 125. Machinery for application of screening to window and door screen frames.
- 126. A new and faster method of making metal bead chain.
- 127. A machine for rapid laying of concrete sidewalks.
- 128. A method of making chicken wire by welding rather than by twisting.
- 129. Jaws for a vise that will conform to the shape of the article held.
- 130. A power lawnmower so designed that it will not damage the lawn when turning.
- 131. For cemeteries, a grave-digging machine operated by a small gasoline motor.
- 132. A means of keeping bicycle chains constantly lubricated.
- 133. An improved metal fastener, to be used on wood, that may be driven into place with a hammer.
- 134. A lawnmower that will cut weeds with tough stalks rather than rolling them down.
- 135. A cheaper sprinkler for lawn fertilizers.
- 136. A mechanical arrangement that will prevent sewers from backing up in cellars.
- 137. A cheaper means for making high-speed drills.

- 138. A simple office machine that will recondition used paper clips. The paper clip is a source of considerable expense in large organizations.
- 139. A simple machine for caulking boats.
- 140. Improvement in photo-developing machinery to speed drying and handling.
- 141. An adjustment on a wood plane that will be calibrated with a scale reading in thousandths and hundredths of an inch.
- 142. A practical, gearless motor speed reducer suitable for use on home machinery such as lathes, drill presses, etc.
- 143. A combination machine for the home workshop that can serve as a lathe, drill press, sander and grinder.
- 144. Improved frames for tents, made of steel or aluminum tubing and capable of being quickly set up and folded for carrying.
- 145. A more perfect filter for the cutting compounds used in connection with metal-working machinery.
- 146. Improvements in welding aluminum to other metals with higher melting points.
- 147. An induction heating furnace cheap enough for use in small shops and factories.
- 148. A saw set and filing device that will operate on ten teeth at a time.
- 149. A power-driven device that can be used to clean files that have become fouled.
- 150. A tiny steam turbine that will operate at high speed for forced draft on coal furnaces.
- 151. Bicycle with a simpler gear-shift for climbing hills.

Radio

1. A vacuum tube that will give absolutely distortionless reproduction of music and voice.
2. A method of filtering out the undesirable noises caused by static interference is still a problem of great magnitude and it is a problem that is causing no end of trouble in the radio industry as a whole. This can be done with FM broadcasting but that means changing every broadcasting station and receiver in the world.
3. Static does not cause the only kind of interference in radio. Code sending transmitters cause a great deal of trouble and some method of sharper tuning either at the transmitter or at the receiver is needed.
4. There are many loud-speakers on the radio market but not one meets the acoustic requirements of a perfect device. We cannot expect a single diaphragm which has a very definite sound period of its own to respond to the wide range of frequencies used in radio transmission. Yet that is exactly what our loud-speaker manufacturers are trying to do. We need a loud-speaker with a multiplicity of diaphragms of different sizes or one single diaphragm so constructed that it will be sensitive to a very wide range of frequencies.
5. Even small success with the transmission of power by wireless would lay the foundation of a great new industry and equip the inventor with basic patents that would be worth large sums

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of money within the next few years. The inventor must not forget that a basic patent obtained at the right time may at a later date be of great value although it originally amounts to little.

6. The insulating materials used in radio receivers today are rather expensive and many users of radio equipment resort to the cheaper materials which greatly reduce efficiency. A real cheap insulating material having the desirable electrical properties would make for its inventor a great deal of money. Before this problem is started on, the available literature on the electrical properties of insulating materials should be investigated.
7. Bank-wound coils are used a great deal in radio and the winding is of such a peculiar nature that much of it must be done by hand. A machine that would automatically make a bank-wound coil would be a valuable asset to radio manufacturing.
8. The next great field for radio development will be in the reduction of radio to personal use—that is, individual receiving and transmitting sets small enough to be carried in one's clothing, providing radio communication between individuals as now exists between stations.
9. More and more attention is being paid to low loss coils in radio sets and the inventor who can produce a practical coil that can be wound on a *special machine* at high speed will be in a position to realize something on his work.
10. A very sensitive and yet a very fast recorder of telegraphic code is needed in radio. At the present time eighty words a minute is about all that can be handled because of certain mechanical difficulties largely due to the inertia of the moving parts. If a recorder without moving parts could be developed it would seem that there would be no limit to the speed at which recordation could take place.
11. After earphones are worn for some time they become very uncomfortable and the problem seems to be that of making a

lighter 'phone. Perhaps the 'phones could work on a different principle so that heavy magnets would be unnecessary. The present 'phones weigh from 8 to 12 ounces and it would seem that a successful light 'phone with headband should not weigh any more than 3 or 4 ounces.

12. A true anti-capacity jack is needed. By this is meant a jack that will not function as an electrical condenser by having its parts arranged so that two flat mechanical surfaces are separated by dielectrical material.

13. Engineers agree that radio frequency amplification is the coming thing in radio. It would seem that the greatest need for the successful introduction of this form of amplification is a tuned radio frequency transformer. Unfortunately radio frequency amplification to be really successful must be accompanied by a change in the wave length fundamental of the transformers used.

14. Grid leaks are high resistance units used in radio and they are usually made by allowing india ink to dry on ordinary bristol board. It has been found that units made this way do not hold their resistance accurately. After a few months the resistance lowers to an appreciable extent, sometimes as much as 100%. This may or may not be due to molecular changes in the carbonaceous coating, however. Some method of preventing this change is needed and it is up to the inventor to find it.

15. A dependable and inexpensive record changing device that could be quickly attached to and removed from portable phonographs.

16. With one exception, tuning knobs are fastened to the condenser shafts by set screws which prevents them from turning true on the shaft when rotated. Some method of mounting a knob on a shaft so that it will run true will be welcomed by manufacturers who strive for neatness and efficiency.

17. There are many needed improvements in vacuum tube transmitters as the literature on the subject will disclose.

18. A headband that will keep the 'phones in good position for hearing but that will not press them too tightly against the ears.

19. Many attempts have been made to make variable grid leaks, but there are few on the market at present that will hold their resistance or give accurate measures of resistance between wide ranges.

20. A method of quickly changing frequency of radio transmitters over an unlimited range.

21. Although the Marconi Company of England has done a great deal of experimentation on a device that will call radio operators by wireless there is still a missing link that must be supplied by some ingenious experimenter.

22. One of the chief drawbacks in the science of telemechanics or the control of distant mechanisms by radio impulses is that of the selector whose work it is to guide the impulses to the various parts of the device to be controlled so that different functions can be performed. The public library will be found to contain much information on the subject or the reader is referred to the book, "Teledynamics" published by the D. Van Nostrand Co., New York City.

23. Radio sales are depending more and more upon the cabinet construction as well as technical efficiency. Inventors will do well to bend their efforts toward designing radio cabinets that will have advantages in acoustics, appearance and compactness over present types.

24. It has been found that a layer of oxide on an antenna wire interferes considerably with receiving efficiency and some coating or chemical preparation that will prevent oxidation is needed.

25. The average life of a vacuum tube is now in the neighborhood of one thousand hours and very often the last two or three hundred hours of operation are accompanied by distorted reception. A vacuum tube is needed that will not decrease in efficiency during its life and that will last at least two thousand hours without costing any more than the present tubes.
26. A radio set so designed that it will be operative over long distances without the use of an antenna.
27. Insulators of moulded glass that will have sufficient strength to withstand heavy strains.
28. At the present time it is impossible to use over two stages of audio frequency amplification without causing great distortion. Some method whereby three or more stages of audio amplification could be used would be welcomed by radio manufacturers.
29. High power transmitter vacuum tubes operate at high heat and cooling methods have to be employed. This is usually done by running water through the base, but some more efficient system with less possibility of electrical loss through the water columns should be devised.
30. An entirely new method of generating high frequency current aside from the vacuum tubes, the spark or the conventional form of alternator would be a welcome contribution to radio science.
31. Radio engineers admit that the crystal detector is the one perfect device for the faithful reproduction of radio music. However, it has been found impossible to amplify crystal signals without resorting to vacuum tubes. If crystal amplification could be devised radio would be revolutionized overnight.
32. Electric filters are used to filter out certain frequencies and unwanted noises. There is still a great deal of research work to be done in the proper use of filters and filter systems.

33. Although a great deal of valuable research work has been done in the recording of radio-transmitted messages by automatic typewriters there is still plenty of opportunity for improvement that will some day be of great value.
34. An improved method of making mica condensers which will have low electric losses is one of the desirable improvements anticipated by radio engineers.
35. Gongs and lights are now used to call officials to their offices in large factories. Both gongs and lights disturb the employees and it seems that a radio call system that would be perfectly silent in operation could be devised.
36. At the present time it is practically impossible to make vacuum tubes with uniform electric characteristics. One thing that militates against this is the difficulty of producing two high vacuums that will correspond perfectly. If something could be done to assure this result vacuum tubes would become more efficient and more useful in radio circuits.
37. A simplified method of wiring radio sets for fast production is coming to be almost a commercial necessity.
38. A system of connecting radio sets that will do away with soldering. Perfect electrical connections are necessary.
39. Telautograph devices are used to transmit handwriting and at present they work only by wire. A radio telautograph would be a valuable invention.
40. An entirely new principle of wave production.
41. A small cone loud-speaker that will reproduce the higher frequencies as well as it produces the lower ones.
42. A portable radio designed especially for police use.
43. A new system of audio frequency amplification that will function by causing large variations in the plate current of the amplifying tubes.

44. An audio frequency transformer that can be adjusted for high efficiency amplification for various frequencies.
45. A method of making non-resonant paper horns.
46. One or two cells in B batteries often fail while useful life is still left in the remainder. This practically renders the battery useless. This trouble could be overcome if some form of practical renewable B battery could be developed.
47. A big obstacle to television is lack of a satisfactory method of amplifying images with the same efficiency that sound impulses are amplified by ordinary radio receivers.
48. A method of keeping sleet and ice from the antenna wires of high power radio stations.
49. Litzendrad wire which is made up of a number of small strands bound in silk is now the most efficient wire for radio purposes, but its costliness prevents its universal use. Therefore, a means for producing a cheaper high efficiency wire that will cost little more than standard wire is needed.
50. A method of using microphones in such a way that they will amplify at audio frequency without the use of vacuum tubes. Such an amplifier has been brought out in England but its cost is too high for ordinary users.
51. A way of moulding papier mâché so that a smooth finished product will result without hand work in surfacing.
52. A new way of fixing tinfoil to the surface of mica for condensers. The more closely the tinfoil adheres to the surface of the mica the higher the efficiency of the condenser.
53. An oscillating crystal which will be as sensitive as a vacuum tube.
54. A type of switch that will remove the unsightly contact points from the front of radio cabinets. This will also prevent the drilling of holes in cabinets.

55. A gear driven vernier attachment for variable condensers that will entirely overcome lost motion.
56. A variable condenser that will be short-circuit proof.
57. Radiations from oscillating receivers can be prevented at present by the use of a stopping tube but this is an expensive way of doing it. A little attachment that will sell for a dollar or so would be bought by hundreds of thousands of users of radiating receivers.
58. An attachment for radio receivers which would automatically tune out speakers or announcers so that music could be heard continuously.
59. Solder wire combined with flux. There is at present such wire on the market but it has a resin core which melts and runs out of the wire before the solder reaches the melting point. This is undesirable and good soldering can be done with it only under great difficulty. A combination of solder and flux is needed that will not be so troublesome.
60. A hard rubber composition that will not turn greenish-brown with age.
61. Inexpensive non-vacuum tube rectifier for 110 volts.
62. Vacuum tubes with an electronic supply so high that high voltages will not be needed to be employed on the plate of the tube.
- 63.* Radio-controlled airplane.
- 64.* Radio-controlled torpedo.
65. When the filament of a vacuum burns out the tube is practically useless. A tube with more than one filament would meet with wide sale.
66. A more practical method of transmitting on one meter or less.

67. A loud-speaker in which the size of the diaphragm, or rather the effective vibrating area of the diaphragm can be changed. This type of loud-speaker could be adjusted for high pitched vocal rendition or higher pitched musical instruments.

68. A radio-controlled traffic signal system for large cities.

69. A radio-controlled block system for railroads that will prevent accidents.

70. A non-flashing, non-sparking, non-arcng key for use on radio transmitters employed on airships with inflammable gases.

71.* A small, compact, highly efficient transmitter that will have an exceptionally long range in miles per unit of weight. Such a transmitter is needed for airplane work.

72. A chemical compound that may be painted on the outside of aerial wires and connections to prevent oxidation.

73. A device for making connection with the ground that will produce a low resistance with the equivalent of a large area. This should be small and should contain some sort of a chemical substance that will keep the earth moist in the vicinity.

74. A way of grounding a radio set automatically when the tubes are turned off.

75. At the present time business establishments are protected with wire-controlled burglar alarms that cause bells to ring in central offices when the protected premises are entered. A radio-controlled system to obviate the use of these wires would make the system less expensive.

76. The variable condenser of the present time has rather a small capacity considering the amount of space it occupies in a radio receiver. This is because of the difficulty in bringing plates close together without danger of short circuits. Some method of producing a condenser in which the plates will be but a few thousandths of an inch apart will not only make them smaller but more efficient.

77. Increasing the life of vacuum tubes. This must be done by constructing the filament in such a way as to give a greater number of operating hours.

78. A radio system for coal mines that will operate through comparatively large sections of earth. Such a method of signalling would be of great value in times of disaster when men are entrapped.

79. Improved system of radio dynamic control which will be more positive in action.

80. A radio-controlled sub-station for electric light companies. There are numerous subscribers throughout the country that are under the care of one man who has very little to do save throw a switch in the morning and at night. A radio-controlled sub-station is not at all impractical and could be very easily developed.

81. Vacuum tube sockets usually make the tubes microphonic by picking up vibrations and transmitting them to the elements of the vacuum tubes. A shock-proof socket is needed.

82. Many beautiful musical selections are coming over the radio at the present time and if some simple way of recording these on phonographic discs was developed it would be possible for radio users to make their own phonograph records and to preserve the music they liked. The present system is too costly and does not produce fidelity.

83. A combination of instruments that will instantly indicate all of the tube characteristics, for testing vacuum tubes.

84. A number of radio manufacturers are on the watch for an improved telephone plug. One is needed in which the telephone wires can be easily connected and disconnected.

85. A material for the cones of dynamic speakers that will not be affected by conditions of the atmosphere.

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86. Sharper tuning for radio receivers.
87. A radio vacuum tube that will last a lifetime.
88. The perfect high-speed, hand-operated radio dial has yet to appear.

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Instruments

1. Instrument or method of testing metals for corrosion resistance which will forecast the life of these metals under service conditions.
2. Instantaneous method of spectrum analysis. This now requires about two minutes or longer. If we could get this result in, say, 1/10 second, we could do many things now beyond us.
- 3.* Greater accuracy in seismograph instruments and seismograph surveying in connection with petroleum.
4. Portable, electric or chemical method of identifying ferrous and non-ferrous materials without damaging the product under examination.
- 5.* Easily-operated indicator for temperatures of molten steel, both in the melting furnace and in the pouring ladle.
6. Instrument for determining the copper content of steel alloys.
7. An instrument or an economical method to control exactly temperature and humidity of air and to enrich the oxygen used in blast furnaces.
- 8.* Temperature measuring device that will give readings from 1500-3000 degrees C. and above. Optical or radiation pyrometers, because of the gas atmosphere in the temperature pipes, produce erroneous readings.
9. Positive temperature control on storage and display cabinets using dry ice as a refrigerant, using no pressure vessel.

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10. Metering and recording device for calcium hypochlorite.
11. Small heater-thermostat combination that will automatically keep instruments above freezing and not give off any heat when the temperature is above 40 degrees F.
12. Non-destructive test method for determination of concentrated stresses in solids such as porcelain.
13. Inexpensive portable carbon monoxide indicator having accuracy equal to that of the M. S. A. Indicator or the Iodine Pentoxide Apparatus.
- 14.* An apparatus similar to the visual sound and pressure devices which could be used to measure energy or sound gradients such as occur around the surfaces of an airplane and inside of cooling and carburetor air ducts. This would be extremely useful in flight testing and wind tunnel work to detect regions of bad flow from which information could be gained for corrective measures. The device should consist of exploring elements and should be as minute as possible in any location to measure conditions at a definite point. The system should be capable of measuring very small variations, such as .5 mph in 400.
15. Accurate metering device for slush pulp systems.
16. Instrument for measuring very low rates of air movement in very small spaces.
17. More dependable means of locating subterranean oil deposits.
18. Sturdy, portable draft gauge which will accurately read pressure variations of 0.0001 inches water column, but will not be affected by temperature changes.
19. Time device on right and left turn traffic indicators so that after a given number of seconds, the indicator goes out.
20. Fume eliminator for buses.

21. A method for measuring and controlling moisture content at temperatures just above and below 212 degrees F. There is a specific need for this in the textile industry.
22. Automatic street announcer for street cars, buses and rapid transit cars.
23. Headway recorder for buses.
- 24.* Instruments for more adequately measuring the lubricating effectiveness of lubricants.
25. An inexpensive means for determining whether eggs intended for incubators are fertile.
26. Straight reading counters that can be turned as easily as wattmeter type counters.
27. Indicating or recording instrument for continuous determination of the moisture in a clay mass at the wet pan or at some other suitable point in the process.
- 28.* A portable instrument that will record humidities at temperatures between plus 32 degrees F. and minus 32 degrees F.
- 29.* Automatic indication of boiler water concentration.
- 30.* Devices for detecting cracks in boilers and other pressure vessels.
31. A non-destructive method is being sought by the steel casting industry so that slight defects can be ascertained and practices for their elimination studied progressively without destroying the product itself.
32. A home weather instrument that will co-ordinate barometric pressure, temperature, dew point, etc., and make hour-to-hour weather predictions.

Textiles

1. Development of a cotton plant to produce a variety that would find a new place in textiles. The rayon manufacturer, along with chemical research, developed staple and spun rayon which is displacing a great many uses of wool. Growers of various varieties of fruits have produced wonders by crossbreeding. It should be possible to produce cotton with qualities superior to the fibers we now have. I have seen cotton treated chemically to assume the appearance of silk, and much cheaper and easier to handle. Much thought has been given to what might be applied to the cotton fiber to alter the appearance. Something more fundamental than a superficial application must play its part, something chemically to make cotton not cotton.

2. Textile processing previous to dyeing operations, particularly scouring and bleaching of cotton piece goods, is cumbersome and time consuming. The present method is set up to handle enormous quantities of goods of the same construction and weight. We need a more flexible process, allowing the preparation of goods in shorter time.

3. Development of substitute fiber for rabbit fur used in hats and felts will result in a substantial reward for the inventor. The present European situation has seriously affected supply, but even in times of peace, rabbit skin supplies fluctuate widely. The price tends continually higher because while rabbits furnish a living to certain groups, they are a menace to truck farms

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with the result that the total world supply will probably decline over a given period.

4. Fabrics made in the same manner as paper which can be washed and dyed, and be equal in strength, flexibility and wearing qualities to woven cloth.

5. Means for preventing slippage of the individual cotton fibers in the cotton yarn. Fractures in yarn are caused by the slippage rather than the breaking of the fibers themselves. To solve that problem would widen at once cotton's usefulness in industrial fabrics.

6. Method to eliminate kier boiling, which now consumes from eight to twelve hours in the preparation of each lot of goods. It should cover cotton cloth weighing from 10 yards per pound down to $1\frac{1}{2}$ yards per pound.

7. Fireproofing and crease-proofing processes for the cotton industry.

8. Product through which cotton cloth could be immersed as it leaves the singeing machines to cause the natural gum and mill sizing in the goods to loosen and disintegrate quickly, would be of inestimable value.

9. Process by which vegetable fibers could be secured directly from the plant, eliminating the problems of separating the fibers from waste materials.

10. Coarse wools used in soft floor coverings are all imported, no carpet-wool bearing sheep being raised in the United States. We need a synthetic staple fiber which "can stand on its own legs" against wool. The market available is 150,000,000 lbs. a year.

11. A tire cord of much higher tensile strength and ability to withstand the extreme flexing requirements and high temperatures of the modern tire.

12. The furniture industry is dependent on foreign suppliers for jute products such as webbing, burlap and twines. We believe these products can be produced from cotton.
13. The mop industry needs a loose-textured yarn for greatest absorption of water which will not shed cotton.
14. Manufacture of artificial silk out of oil.
15. Development of a domestic linen industry. We are entirely dependent on imports.
16. A means for keeping collar points from turning up. A host of patents have been granted for this, and some have been fairly popular, but the perfect solution remains to be found.
17. Method of treating cellulose and other organic fibers to permanently increase their water-repellency and prevent swelling of the fiber when wet.
18. Research on natural silk to enable it to hold its own against Nylon.
19. The Venetian blind industry uses approximately \$1,000,000.00 worth of perishable cloth tape per annum which must be replaced every five years. We need a more permanent tape, easily cleaned, which would not disintegrate under atmospheric conditions. Tape usage may easily become \$5,000,000.00 a year within the next ten years.
20. Opaque rayon sheet with a feel and strength of a woven fabric, but made on a cellophane machine.
21. Method of laundering window curtains and other household items trimmed with cotton accessories to keep their original fluffiness. They now have a crushed and matty appearance as a result of the present methods of washing.
22. Inexpensive method of waterproofing cloth, weighing approximately six yards to a lb. and counting 60x64 threads to the inch.

23. Mothproofing materials, easily applied to wool, which would become a part of the fiber and not affect the "handle" of the wool and be unaffected by drycleaning or ageing.
24. Hat shower-proofing, including body, band, sweat-leather and lining.
25. Process of dyeing and finishing complete with the use of cold water.
26. Men's felt hats with permanent crease built in at factory.
27. A fastener to replace the zipper that will not catch the flesh.

Metals

1. A low-temperature method of separating iron oxide from the gangue materials with which it occurs in nature. Such a development would obsolete all the blast furnaces and most of the coke ovens.
- 2.* If a cast iron could be developed that would bend under stress rather than burst, it would be the greatest single development in our industry. Such an iron has been made for laboratory tests.
3. An alloy for use in refining equipment that will resist both hydrogen sulfide corrosion at high or low temperature and hydrochloric acid corrosion at low temperatures.
4. A metal that can be fabricated in a soft state, then hardened to withstand wear as well as the corrosive action of the anti-detonating elements used in aviation gasoline. This is a difficult situation in fabrication of carburetors and fuel injection apparatus.
5. One of the great fields for advancement in the metal industries lies in powder metallurgy. It is perhaps the future method of making intricate parts.
6. A cheap pure iron powder to be used in the field of powder metallurgy for producing oilless bearings and small machine parts.

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7. A metal to be used in bank vaults with a tensile strength at least equal to a good cast iron, that can be machined, drilled and tapped, and yet resist the oxy-acetylene torch.
8. A process for the shaping and forming of steel direct from the open hearth ladle rather than the intermediate step of casting into ingot form which produces such phenomena as segregation, piping and slag inclusions.
9. If some inexpensive method of producing gray iron castings in permanent molds were developed, it would mark a great advance.
10. A die-casting method whereby finished castings may be heat treated to increase hardness and durability.
11. A low cost corrosive-proof cast iron for use in the oil industry to combat corrosion caused by sulphur gas or sour oil.
12. If some method whereby stainless steel, even though it is different from the present nickel-chrome content steel, could be developed which could be sold at a price more in line with the prices of brass and copper, the additional usages which it could be put to and the additional industries which might arise, could be of a vast amount of benefit to the nation.
13. Stainless steel that would not be discolored by heat encountered in flatirons and toasters.
14. In the manufacture of large power washing equipment, we use monel metal or stainless steel. These resist a great many acids that washers do not meet. Accordingly, we are paying too much for the degree of corrosion resistance which we require. We need a metal not attacked by soap or water, having a structural strength approximating monel or stainless steel.
15. A stainless steel material in tubing form, approximately 12" OD, 18 gauge wall which would have an expansion and contraction ratio equal to 20-80 copper alloy.

- 16.* Stainless steel that has a yield point of 150,000 lbs. sq. in. Such a material would be extremely valuable in aircraft construction.
17. Stainless steel resistant to brine corrosion and costing not over 5¢ per pound over Type 302.
18. Stainless steel completely resistant to differential corrosion from oxygen concentration cells.
19. Reasonably priced steel, highly resistant to corrosion from wet coal, in rolled shapes, plates and castings.
20. The steel casting industry needs a method of sulphur reduction in melting practice to reduce the final sulphur content.
21. Better materials and methods to prevent cavitation on turbine blades.
22. Metals with greater strength and lighter weight for use on excavator fronts.
- 23.* Free machining, heat- and wear-resisting steel bars suitable for machine gun barrels.
24. Non-corrosive material having much greater stiffness and strength than stainless steel for use as stuffing box shafts for flow meters.
25. Stainless steel of the 18-8 variety in wire form, more susceptible to trimming and machining than the varieties now on the market.
26. A malleable, machinable alloy with magnetic properties comparable to Alnico alloys would greatly improve marine compasses.
27. An abrasion-resistant steel alloy as hardenable and corrosion-resisting as 18-8 or KA2.
28. An acid resistant metal similar to Hastelloy, Illium, pure nickel, or Monel, which will not have a tendency to gall when run together.

- 29.* A steel alloy which will cast readily, machine freely, and be acid- and heat-resisting.
30. A moderately-priced alloy resistant to corrosion from wet chlorine.
31. A corrosion-resisting alloy of an extremely low yield point and low tensile strength, suitable for ordinary drawing or spinning into concave and convex heads in sizes of $\frac{1}{2}$ " and 24".
- 32.* Metal alloy that would resist pitting from electrical arcs.
33. More ductile steel for deep drawing.
34. Light metal die-casting methods to better approximate mirror surfaces and avoid surface blemishes.
35. A process for injection-moulding of steel.
36. A non-rusting wire fence and steel post to compete with steel wire and angle posts.
37. A light, strong durable metal to be used in fabricating boats that would withstand the elements of weather and salt water. If such a material can be developed, our industry would be put on a basis comparable with the automotive industry.
38. The steel industry very much needs improved technique to bring Bessemer steel to a quality rating entirely competitive with that of the open hearth process. Since the Bessemer process uses only 5% of steel scrap, while the open hearth uses 60% scrap, this would free the steel industry from the vagaries of the scrap market.
39. High speed steel, comparable to the present alloy which contains 18% tungsten, but which will have but 2% tungsten, using molybdenum instead.
40. A magnetic steel with zero magnetostriction.
41. A magnetic material with better permeability and less loss than standard motor or transformer iron.

42. A metal having an especially high impact strength for use in an impact testing machine. We could pay well for this.
43. Reasonably-priced steel tubing from 4" to 20" in diameter, which can be safely operated under 800 lbs. pressure and temperatures of 1000 degrees and non-corrosive under the severe conditions under which expansion joints operate.
44. A method for producing German varnished spaghetti tubing with a smooth varnished inside surface.
45. Pipe which will retain a hard, smooth interior surface or an inhibitor for various fluids subject to oxygen concentration to eliminate attack for ferrous metals.
46. Methods for forming and fastening thin sheet metal sections for fabrication.
47. Method for non-destructive examination of ferrous materials and welds.
48. Machinable casting alloy, insoluble in either hot or cold milk.
49. Alloy that will resist brine, that can be rolled into sheets and be suitable for contact with milk.
50. An alloy suitable for continuous service at 2000 degrees F., with good strength at that temperature, non-brittle when cooled and able to be fabricated into sheet, rod and seamless tube forms. It should be readily weldable and not cost over \$1.00 per pound.
51. Magnesium alloys which are light and non-corrosive.
52. A non-tarnishing alloy with a minimum of 925 parts of silver in 1000 will be received with open arms in the sterling ware industry.
53. Metal that will retain a tensile strength of at least 60,000 lbs. per sq. in. at a temperature of 2200 degrees F. for use in mandrels and dies.

54. A gasket metal for refrigerator units, soft enough to function as a gasket, but not so soft that it will flow under stud pressure.
55. A steel for use in die casting of brass which will give a life comparable to that now obtained in die castings of zinc.
56. Bodies for metal containers produced from drawn or spun tubing.
57. A metal for use in the rotary pump industry that is more resistant to wear under non-lubricated conditions.
58. Metal with spring resilience strength and weight of hickory that would not expand or contract with changing moisture content and temperature of air from 40 degrees below to 140 degrees above zero.
59. The tool industry would like a material between the so-called high speed steel and the cemented carbides and stellite type materials.
60. Non-ferrous alloy having the property of a lubricant as well as a high tensile strength and yield point, and impervious to the leaking of liquids and gases through its structure.
61. Method of securely attaching a short piece of high speed steel to a longer piece of less expensive material so that it could be annealed, machined and heat-treated without injury to the bond, for pipe threading dies ranging in size from $\frac{1}{2}$ " x $1\frac{1}{4}$ " to 1" x $4\frac{1}{2}$ ".
62. Steel in the form of wire and wire rods, free from seams and scratches.
- 63.* Small diameter steel wire which would be rust-proof without coating and without the expensive stainless process.
64. Resistance wire material having a zero temperature coefficient and a resistivity one or two orders higher than now available.

65. A flexible aluminum material to produce flexible aluminum Venetian blind slats.
66. A lighter material for frame and body construction for trucks. Aluminum is much too expensive.
67. Metal saggers that will stand 1300-1400 degrees C. without distorting, blistering or oxidizing.
68. An inexpensive low resistance, non-fusing, non-corroding contact material for use in devices that open or close electrical circuits.
69. In the condenser tube field, considerable difficulty has been encountered in obtaining corrosion-resistant condenser tubes.
70. A die-casting material which would stand a higher temperature than zinc and, therefore, be suitable for use in flat irons, electric toasters, etc.
71. A metal that would flow at a lower temperature and be of a nature more nearly solid (as in a plastic) and which would drive air ahead under pressure rather than allow air to enter throughout its body, would be extremely valuable to the entire printing industry.
72. The dairy industry needs alloys satisfactory for drawing into tubes and castings which contain no copper, or are so insoluble that no copper is dissolved by milk at any temperature.
73. A means to make copper and brass stainless would be very valuable.
74. White brass or an easily machined stainless steel from which small parts could be made without requiring any additional finish.
75. An inexpensive brass alloy of high electrical conductivity.
- 76.* Of inestimable value to manufacturers of bearing bronzes would be a material to take the place of tin in bronze alloys.

77. A tarnish-resistant bronze powder for application in the graphic arts.
78. A process for making parts for magnetic purposes by means of powder metallurgy to have better magnetic properties than is now possible from rolled silicon iron bars.
79. A brazing material with a melting point above that of standard solder and below that of silver solder, capable of joining materials of copper and brass without red heat.
- 80.* Soldering flux that will not cause corrosion of soldered parts in service.
81. Lead free solder with a melting point of 700 F., unobjectionable when in contact with milk.
- 82.* An aluminum solder to work as well as common lead solder does on tin.
83. A method of refining high-carbon ferro manganese to eliminate carbon, or a direct method of preparing low-carbon ferro manganese, would be extremely valuable.
- 84.* An economical process for the recovery of manganese from low grade ores would be of vast importance to the United States.
85. Development of a chromium plating process for use on aluminum.
86. Method of plating, with brass or bronze, pieces previously coated with cadmium plate.
87. A tin-plating process that will produce a bright finish.
88. A commercial method of applying zinc in pipe, ranging from $\frac{1}{2}$ " to 6" I.D., by the electrolytic process would be a very big step forward.
89. A method to prevent spotting of brass-plated malleable iron castings made by the bench molded process.

90. Reasonably priced material for piping, tanks, pumps, etc., which would be resistant to the corrosive action of strong brines containing potassium and sodium chloride.
91. Better and longer-lasting dies for powder metallurgy.
92. A rapid method of making heavy chain by means of electrically welded links.
93. A method of lowering production costs for stainless steel by half.
94. A method of fabricating strong and light metal oars and paddles.

Food

1. A process for canning green vegetables whereby the natural green color of the food is retained through the canning process and subsequent storage by a method which prevents the destruction of the chlorophyll, upon which the natural green color is dependent.
2. A good liquid or powdered coffee extract which, upon dilution, would yield a beverage with taste and aroma fully equal to that of freshly and correctly brewed coffee.
3. In the field of flour milling, a perfection of processes and methods whereby certain vitamins may be added or retained in white flour, without decreasing its storage qualities.
4. A drying or processing method to produce whole dry milk, including the butterfat, in such form that the butterfat will not become rancid during reasonable length of storage.
5. A means of raising the melting point of chocolate so as to lengthen the shelf life of chocolate-coated candies. The production of chocolate goods is almost completely halted by the hot, humid climatic conditions of the summer months.
6. A problem that flavors introduce is that of rapid oxidation and subsequent rancidity. There is a marked need for a good anti-oxidant for many food products.
7. Because most manufactured cookies are alkaline and are subjected to rapid baking at high temperatures, delicate flavors are not retained well in the finished goods. If a fixative, or process for retaining delicate flavors in manufactured cookies could be

developed, it would be very valuable to the biscuit and cracker industry.

8. There are several hundred million bushels of soft winter wheat produced in this country each year, but with the advent of high-speed dough mixing machinery, this wheat is not adaptable to bread making. We need a process or material which could be added to soft wheat flour that would activate the protein so that soft wheat flour could be put through modern bakery equipment. With this, a large agricultural area, particularly that lying east of the Mississippi River, would be helped materially. Furthermore, it would improve the quality of the loaf of bread.

9. Some way of retaining oven aroma in bread and other bakery products for 48 hours.

10. A successful process for preserving bread by freezing.

11. There is a need for revamping the system used by bakers to get their products to the consumer oven-fresh. The canning industry makes units suitable for small-sized families. For example, a small can of peas may be purchased sufficient for two people. The contents are entirely consumed at one meal and there are no left-overs. Bakers might do well to follow this lead.

12. A cheaper bleach for flour that will do the same job as Novadelox or Agene.

13. A product which added to a cereal will be harmless and tasteless to human beings, but would prevent infestation by weevil or flour moth.

14. A yeast whose rate of action in the doughs would be slower at temperatures of between 80 degrees to 90 degrees F.

15. A method to reduce the high cost of distributing milk to the consumer. This will probably be a specialized process for concentrating and canning milk to so preserve the normal color

and flavor of the product that when diluted back to original volume in the home, it will closely simulate pasteurized milk. Such a process will enable the producer to can milk in areas where milk is cheap, and deliver a supply to last a month or more.

16. A method of freezing cream so that when remelted it retains all of the properties and taste of fresh cream.

17. A better alkali for neutralizing the acid in sour cream for butter making. The lime neutralizers now in use make the cream too thick for easy thorough straining. The soda neutralizers facilitate straining, but have an undesirable flavor.

18. The citrus industry needs a quick method of removing the green chlorophyll without injury to the skin of the fruit.

19. A canned, dried or frozen orange juice which would retain the flavor, color and vitamin content of fresh orange juice.

20. In the refining of cane sugar, the greatest needed development is a cheaper method of decolorizing sugar syrups. The present standard method of filtering these syrups over bone char is expensive, slow, and tedious.

21. When we mix a sponge to make soda crackers, yeast is added which is allowed to ferment until there is a considerable amount of alcohol formed which is lost when the baking process begins. The recovery of this would lead to considerable profit.

22. Every year thousands of tons of peach pits are hauled to the dump. Inside the pit is the peach kernel in which is concentrated the entire essence of the peach. We need a process whereby the kernel could be utilized to flavor peach products.

23. A method whereby we can put a beef belly (carrying very large amounts of exposed fat) into storage for periods up to one year and then bring this belly out, defrost, put to cure and market with the fat in good condition. This is not possible now

because the fat suffers deterioration, resulting in the fishy, rancid flavor.

24. A system of meat distribution whereby all of the boning is done in a central meat-packing plant with nothing left for the butcher to do but hand out the packages.

25. The packing industry would like a process to afford improvement in the keeping qualities of meats. Generally speaking, we endeavor to retard bacterial growth by (1) chilling or freezing, (2) packing the sterile product in air free container, either tin or glass, (3) the use of salt, and (4) desiccation. These processes are still fundamentally the same today as they were at the beginning of our history. A large field for development seems to be wide open.

26. The packing industry has slipped into a deplorable condition with respect to the manufacture and sale of lard. At least one hundred million additional dollars could be returned to the hog farmers of the country if lard were back on the same basis it was before the advent of the various types of shortening oils. Successful research in relation to the manufacture and sale of lard for new purposes would have a very far reaching effect.

27. There is an almost unlimited field for research in both edible and inedible by-products of the meat-packing industry. Much is still to be developed through improved uses for bone, blood, hair, wool, leather, etc. Animal glandular derivatives and the use of liver as a therapeutic are but two examples of new uses for edible by-products.

28. Process to convert the solids in spent distiller's grain after it has passed through the drying equipment. This material is a thin liquid and is now wasted although a considerable quantity of protein and livestock food value still remains.

29. A method of quickly and accurately determining the vitamin values of foods. Today the process of checking vitamins requires a month's time.

30. A cooking oil or grease for deep fat fryers having a breakdown temperature of 500 degrees F. or higher.

31. A method of preventing the rancidity of fats and oils would extend the shelf life of cereals and other fat-containing foods.

32. A means of bottling milk, entirely devoid of oxygen.

Paints and Finishes

1. In the production of potash ore and its subsequent refining, we have the problem of corrosion, not only to the exposed surfaces of our plant buildings, but to our pipe lines, pumps, valves, and other equipment. We need a protective coating to resist the attack of potassium and sodium chlorides.
2. A paint, or coloring, to be applied directly upon cast iron or steel to withstand direct heat temperature up to 900 degrees for use on furnace doors and stoves.
3. A finish which would give a uniform color to leather, bond with the leather and not be removable either by friction or by water.
4. Primer coats to be applied to oily surfaces so as to eliminate the necessity of cleaning metal before painting.
5. In the manufacture of wool, there is an important loss to the industry because of "paint clip." A new paint for sheep branding is badly needed. It should be insoluble in water, but soluble in alkaline solution. "Clip" is worth about 5¢ a pound, while good wool brings 50¢ a pound.
6. Ice plants are subjected to rapid changes in temperature causing condensation of moisture. We need a paint to retard corrosion on our equipment.
7. Jet black, completely rust-proof, chemical finish on steel and cast iron.

NOTE: Inventions marked with an asterisk (*) are of especial military importance.

8. In the manufacture of dyestuffs and chemicals, corrosive fumes attack the equipment. Our problem is to find a paint which will stand up under fumes that are sometimes acid, sometimes alkaline, and sometimes organic. While it is possible to obtain a coating material to withstand any one of these conditions alone, none will stand all.
- 9.* An aluminum stack paint to withstand out-of-door exposure and temperatures up to 800 degrees F.
10. A cheap and effective method of making cans rust-proof, without having the hazards of an inflammable product.
11. A spray which might carry a color to be blown on a finished package to give it an airtight seal and a varnished appearance. A typical manufacturer turns out a face powder put up in a paper box which carries a printed design. If the box could be rapidly passed through such a spray and receive an exterior waterproof, airproof, glossy finish, it would prove very valuable.
12. An insulating varnish of the reactive type to be baked at low temperature from which volatiles will not be given off in service at higher temperatures.
13. A varnish or lacquer which, when dry, would be flexible, have a high dielectric strength, and be highly flame resistant.
14. In the electrical manufacturing field, we need an insulating varnish for Class A insulation which will withstand high continuous temperatures.
15. A method of polishing brass electrolytically, or a process for depositing synthetic finishes from a bath rather than spraying.
16. In the coating of paper and cloth, a most valuable new product would be a coating material with the working and drying qualities of a pyroxylin lacquer, the gloss and body of a varnish and the flexibility of rubber.

17. A cloth or material impregnated with paint or resin which could be applied to the inside of a steel tank, much as wallpaper, to inhibit corrosion. This would give a greater thickness from the standpoint of film than a painted surface, and would also give body to the film so that small imperfections or pinhole points of attack would be delayed.
18. An inexpensive coating for bronze or copper window screen wire cloth which would protect the woodwork from stain from the wire cloth.
19. A corrosion-proof coating to be used in equipment of petroleum refineries.
- 20.* Durable paint for ship bottoms.
21. A waterproof, dense surface, resistant to abrasion and weathering, is much needed for asbestos shingles.
22. We have yet to find a good paint and varnish remover.
23. Thousands would like a good luminous paint which would stay good for at least two years when exposed to outside influences.
24. An odorless thinner for use in conjunction with some of the newer finishes such as those for food wrappers.
25. The asbestos textile industry needs a liquid or viscous coating of moderate cost that can be applied upon asbestos cloth and will dry with an elastic surface.
26. There is an urgent need for a really non-skid floor wax.
27. A low refractive index oil or vehicle that would permit the use of fairly low opacity pigments, such as barytes, calcium carbonate, and silica, and make them equal in covering power to lead and zinc.
28. A flexible porcelain enamel for use on steel.

29. The first step in porcelain enameling is the application of a coat of enamel containing Cobalt Oxide which is dark in color and which serves no other purpose than to act as a base. A material to replace Cobalt, that would not color the glass, would eliminate the ground coat. It would then be possible, in one fire, to produce any desired color, thereby saving more than one-third of the enameling cost and greatly expanding applications for porcelain enamel.
30. Porcelain enameling produces the most durable and acceptable finish known. The yearly loss, however, due to breakage and handling, runs into millions of dollars. A substitute with heat- and wear-resisting qualities, but not subject to breakage, would be a most worth-while contribution.
31. Our equipment is called upon to withstand both continuous abrasion from gritty material and corrosion from sulfuric or phosphoric acid. We have investigated numerous paint products including rubber base paints, but none proved satisfactory. Our equipment is so large that it must be shipped knocked down and assembled in the field, making rubber covering difficult.
32. A product which would retain a permanent high polish on exterior marble surfaces.
33. A finer control for paint-spray guns so that too much "over spray" can be regulated.

Air Conditioning and Heating

1. There is an English patent covering direct refrigeration by driving an electric current across junction points of pairs of dissimilar metals, but the amount of cooling produced by this direct method is too small. Electric power is now so universally obtainable that the development of a direct process of cooling, without moving parts or refrigerant gases, would bring refrigeration and air conditioning into 75% of the homes, offices and stores in the United States.
2. A compact, reasonably-priced air conditioning apparatus will have a tremendous market. By air condition, I mean not only keeping cool in summer, but properly humidifying in winter. The big cumbersome apparatus of today is like the radio of 15 years ago.
3. The elimination of fumes and dust particles from high temperature gases given off in residential sections adjacent to factories.
4. An economical method of storing winter cold for summer use and vice-versa.
5. Equipment which would enable the use of gas for air conditioning purposes would provide a tremendous volume of business.
6. The greatest source of trouble with all air conditioning is the draft created through the circulation of the air. We need a method to eliminate these drafts.

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7. Moderately-priced unit room coolers which fit like flower boxes in bedroom or living room windows, as well as in beauty shops and doctors' offices.
8. A method of using the same equipment for heating air as well as cooling it.
9. A modern coal heater to compete with the room oil heater. The latter has its good points, but it is a flimsily-constructed affair, dangerous and, in cold weather, expensive.
10. A coal burning combination cooking range and house heating unit for low cost homes, completely insulated so that only the cooking part need be used in the summer, while sufficient heating capacity would be available for five relatively small rooms in winter.
11. A domestic anthracite coal burner so constructed as to prevent the escape of fine ash during shaking, together with a means of ash disposal requiring infrequent attention.
12. A method whereby a supply of domestic hot water can be obtained from the use of only one oil burner where a warm air furnace is used for house heating.
13. In California and Florida, there is a real need for a small compact water heater that will quickly heat small homes with hot water.
14. An efficient fire chamber for solid fuel-burning domestic and small industrial heating plants. The monetary loss, through incomplete combustion, injury to health and damage to property is incalculably great.
15. Equipment to deodorize the air as it is discharged from a fan used in connection with a dust filter. Air containing obnoxious odors cannot readily be returned to the building, even though it is dust free, with the result that the heating problem of the building, where large volumes of air must be handled, is a very expensive one.

16. A low cost dehumidifier for industrial purposes.
17. A means by which moving air may be sterilized in a heating system so as to be free from bacteria.
18. A means to enable the neutralization of H_2S fumes produced during the spinning of Viscose Rayon. In a typical spinning room, there is introduced 325,000 cu. ft. of fresh air per minute which must be heated and humidified at an annual cost of approximately \$50,000.00. If the hydrogen sulfide could be neutralized or scrubbed, this air could be recirculated and a considerable part of the \$50,000.00 saved.
19. One thing very disturbing in lithographic production is atmospheric conditioning, but present air conditioning installation cost and upkeep is so heavy that many businesses cannot stand it. It would cost \$35,000.00 to air condition a fair-sized plate making department and press room, with \$10,000.00 per year to keep it up. We would like to see more reasonably-priced industrial air conditioning.
20. Hot water and steam heating systems that will not gurgle, snap and crack.
21. An odorless oil heater for home use that will not require a chimney.
22. Cheap motor-operated humidifying equipment for use in homes with steam or hot water heat. Should be automatic in operation.

Agriculture

1. An intensified research, which could probably be carried out at our universities, regarding economical and practical application of tray-agriculture. This development is obviously in its infancy.
- 2.* The leading drying oil of the paint and varnish industry is linseed which is derived from flaxseed. Flax is grown in the northwest portion of this country and in California, but for the major portion of our requirements we are dependent on the Argentine. Next in importance to linseed oil is China wood oil, or tung oil, which comes from tung nuts found primarily in the interior of China. I can think of no greater contribution that research can make to the paint and varnish industry than to work out ways and means of giving us the products that we need, made exclusively from domestic oils.
3. The poultry industry's biggest problem lies in the field of disease. Poultry mortality costs the American poultry raiser about \$150,000,000 annually.
4. The manufacture of free halogen iodine fertilizer combined with mineral colloids of a micron size suitable so that plants can assimilate them, would be one of the greatest contributions to science.
5. There are many agricultural products that are being imported that could be grown in this country, but can not be raised on a commercial basis because of labor costs. It has always

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been a problem to find proper employment for prison labor, the trouble being that the average thing the prisoner is put to work on competes with other businesses in this country. If some arrangement could be worked out so that prison labor could be put on developing and growing agricultural products that can not now be grown from a commercial standpoint because of labor costs, that surely would be constructive.

6. Bourbon vanilla beans are practically all grown in Madagascar, Réunion, and the surrounding islands, while the Mexican's are grown in a little area north of Vera Cruz. During the last few years, effort has been put forth to develop the industry in Porto Rico. This should be given study for inasmuch as Porto Rico is part of the United States, and not too far away, it would benefit this country greatly if beans could be grown there.

7. With the Philippines an uncertain future source, it behooves us to seek a new substitute for cocoanut oil, or to develop Brazilian babbassu oil which is the closest match to cocoanut. Soap-makers cannot make good lathering soap without cocoanut oil or palm kernel oil.

8. Our industry uses annually several million pounds of imported starch products. I should like very much to see the domestic starches developed so as to be able to supply us.

9. A method of testing soil for physical characteristics which can be handled by the ordinary skilled workman rather than a highly trained technical man.

10. Improvement in controlling black root disease of sugar beet seedlings.

11. A seedless grape with the characteristics of the Concord.

12. A process to stabilize earth backfill by injecting a cementitious material such as Portland cement grout into the soil.

13. "Binder" for soil en masse to achieve retention of valuable soil and do away with the appalling erosion problem.

Plastics

1. Plastics suitable for food containers, lightweight, odor-free, slightly flexible to be practically unbreakable, to take a tightly sealed cap. They must withstand temperatures necessary for sterilization.

2. Food container requiring no tin. This will probably be a steel container protected with organic coatings manufactured from synthetic resins.

3.* Methods to eliminate the present costly plastic molding machines and molds.

4. Plastic which will possess great strength for making doors, automobile bodies, etc., complete, at comparatively low cost.

5. Bottles made of transparent but unbreakable material.

6. White or colored substitute for cork for use as stoppers for pottery or glass bottles. Should be insoluble in perfumes, liquors, and wines and be flexible enough to overcome minor variations in bottle necks.

7. Cheap, lightweight plastic material with good light transmission and optical properties, having surfaces more resistant to mechanical scratching and chemical attack, for watch and instrument dials, spectacles and protective goggles, where clear vision is essential but non-breakage important.

8. Flexible plastics would revolutionize industry.

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9. Flame-proof, non-shrinkable, transparent plastic material, not adversely affected by atmospheric conditions, to be used as a substitute for glass where walls must be thin and tough.
10. Sound-absorbent material which can easily be kept clean, to be used as lining for offices, telephone booths, etc.
11. Cheap, fireproof material to be used in connection with steel construction for partitions, roofing and flooring.
12. Low-priced synthetic hardwood for building purposes.
13. Fire-resistive insulation requiring a thinner wall section and lighter weight so that safes can be more readily moved so as to bring adequate protection nearer to the records when in use.
14. We need a substitute for piano cases, now made of five-ply wood veneer stock, that would provide the strength needed as well as adaptability to frequent changes in design.
15. The most crying need is for development of a low cost plastic that could be produced molded for 6¢ a pound.
16. A synthetic resin costing $1\frac{1}{2}$ ¢ per pound would have a tremendous market. It need not be a light-colored clear resin provided it has good water resistance, high strength, and good general stability.
17. The carpet industry needs an inexpensive plastic or resin to be applied to woven pile fabrics to pile tufts and backing threads. This would reduce jute yarn imports.
18. Development of a plastic printing plate suitable for letter press printing which can be made as cheaply and as quickly as the one now used for offset, would lead to important developments in photo-composing.
19. A coating for records for electrical transcriptions which would remain plastic for a greater length of time. The plastic material should be such that upon being dried, it will be as durable as pressed records.

- 20.* Dielectric insulating material having very low losses at ultra high frequencies, be non-hygrosopic, non-brittle, and, if possible, reasonably flexible, have a melting point at least up in the red heat region, and have very low conductance for use in the radio industry.
21. New material from which to manufacture high-chair trays. The porcelain enamel removable trays are in disfavor because they chip.
22. Insulated dishes to keep food warm while on the table instead of the present ones which encourage rapid cooling. A coffee cup which would reduce the temperature change would find a large sale.
23. Non-shrinking, non-warping, low cost, non-inflammable, very low moisture-absorbing plastic material that can be made with a large number of color variations for use in fountain pens and automatic pencils.
24. Material to be used for gaskets which now easily disintegrate from the highly corrosive and oxidizing conditions of boiling, concentrated nitric acid. Of course, there are several alloys, but we need a type of material which could be used in an application where its electrical insulating properties would come into play.
25. Plastic material which would give a "warm" automobile steering wheel.
26. Thermo setting molding composition that will hold its shape after ejection from the mold and be free from warping with changes in temperature and humidity.
27. Plastic which may be hardened or tempered by heat treatment or electrochemically.
28. Plastic similar to Bakelite, which would retain its properties up to 600 degrees F., would solve a host of problems now at a standstill.

29. Synthetic material to be used in place of lead cable sheath on high voltage cables, chemically inactive and a non-conductor of current.

30. Colorless resin, insoluble in oils, naphthas, aromatics, alcohols, or water, which will not soften below 400 degrees F., but be non-brittle and non-oxidizing.

31.* Dielectric to take the place of mica, capable of withstanding high temperature.

32.* Material similar to Micarta or Formica out of which to make gears or internal pump parts which will not absorb moisture.

33. Sheet plastic in coils 300 feet long, 1 to 3 inches wide, and .025 to .100 inch thick, out of which to produce plastic products by means of blanking, piercing, and forming in power presses. It is understood that it may be necessary to install heating devices in order to give greater plasticity to the sheet as it passes into a finished product.

34. A plastic round wire from $\frac{1}{8}$ to $\frac{3}{8}$ inch to be delivered in 500 foot coils. It is to contain a continuous imbedded steel core of a much smaller diameter wire to give added strength to the product, the idea being to produce plastic wire products in automatic wire-forming machines.

35. Means of applying plastic tip to shoe laces.

36. Strong plastic fish reel that will not corrode.

37. Plastic and pliable window shade that will not fade from sunlight.

38. A more effective way of fastening plastic handles to knives.

39. A means of making plastic handles for paint brushes that will also hold the bristles.

40. Improvements in machinery and methods for producing extruded forms of plastic rod and moulding.

Miscellaneous

Adhesives

1. Fire resistant dust adhesives are sought by the air filter industry. Must have the capacity for wetting dust particles and holding them against further travel in the air stream at temperatures from below freezing to several hundred degrees F.; must be odorless and non-toxic, substantially incombustible and not give off smoke in objectionable amounts when exposed to flame.

2. A low cost, waterproof glue, not merely a highly water resistant glue, would gain tremendous additional markets for plywood.

3. A cement for leather belting which would be waterproof, greaseproof, and heat resistant up to 350 degrees F., that would make a lap as strong and pliable as the rest of the belt, and that could be applied cold.

4. An improved non-animal adhesive for manufacturing abrasive coated paper, cloth sheets, belts and discs. Also an improved non-animal adhesive for setting up polishing wheels with abrasive. The present silicate cements lack flexibility.

5.* Cement for quickly bonding rubber and metal.

6. A cheap adhesive to glue sawdust firmly together under pressure.

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7. An adhesive for attachment of blueprints to glass, or enameled surfaces, that will not discolor the blueprint but will maintain adhesion in high temperatures and humidities.
8. A non-leaking, permanent joint adhesive for masonry units.
9. An adhesive to adhere cellophane or other moisture-proof transparent films to paper.
10. In the photoengraving field, adhesives are needed to hold the printing plate direct to the wood block without tacking.

Agricultural Equipment

11. A cheap compress for use on farms for the extraction of certain oils, such as soybean oil, at point of production, using the waste material for feedstuff.
12. A generator to produce gas from wood.
13. A machine that will enable the farmer to use his refuse, such as straw, grasses, vegetable matter, with the aid of chemicals, so that during his off-season he can produce fire-resisting covering and roofing material, readily adaptable for farm buildings.
14. Sterilize milk without heating it by the use of supersonic waves.
15. Five- to twenty-gallon batch type electric milk pasteurizer.
16. Electric tractors for farm operation.

Building and Construction

17. Mass production of prefabricated houses would give us the greatest stimulation we have ever had. Practically every new house would have a new gas range, bathtub, refrigerator, washing machine, etc. All that is required is a real determination on the part of a combination of companies to develop, finance, and market this project.
18. Construction methods to eliminate the necessity of conventional framing. With the utilization of plywood panels, a

method of inserting truss members or bracing between sheets of plywood on some kind of linderman joint will afford both strength and rigidity, and connectors for successive panels. With this type of construction, the exterior walls, bearing partitions, floors, and roof decking would have many times the strength and rigidity of the conventional stud and nail construction.

19. In the low cost house, where bathrooms seldom vary from a fixed standard, they should not have to be laboriously assembled by cutting and fitting in the field. A bathroom "chassis," to which the various fixtures might be quickly attached would eliminate much expensive field work and permit vast improvements in bathroom cabinets.
20. Low cost built-in lighting in homes and offices as opposed to the tacked-on form of fixture, particularly with regard to the new fluorescent units.
21. A large board or unit which would enable quicker application over large areas of steep and pitched roof, as well as siding, as opposed to the present method of applying individual shingles or strips of four.
22. A thoroughly reliable inexpensive $\frac{1}{2}$ inch thermostatic mixer for mixing hot and cold water to deliver blended water at a constant temperature irrespective of pressure changes in the supply lines, to be sold at a price attractive to small home owners, apartment owners, and hotels.
23. Economical acoustical tile, fireproof and non-warping, with high light reflection and with an absorption of not less than 80% at 512 and 75% noise reduction coefficient.
24. An inexpensive material for insulating walls and ceilings of medium temperature cold storage rooms 32 and 45 degrees F., and banana rooms, 50 to 70 degrees.
25. A carefully planned system of new super highways would result in an almost endless development of new materials, for

traffic would be speeded up and new materials would be required to withstand the strains of such higher speeds. The development of such a system would influence American business as much as the original concrete roads did.

26. Method for the removal of deleterious particles from concrete by "selective crushing" or flotation.

27. Improve our secondary road system by some cheap, efficient method, such as soil stabilization or the application of a product to the surface and sub-base.

Dyes and Colors

28. Permanent dyes for glass textiles to bring Fiberglas decorative textiles into the field of unlimited color applications. Since glass fibers are completely non-absorptive, ordinary textile dyes which are designed to penetrate organic fibers are unsatisfactory. The dye must adhere to the surface of the individual fibers, resist abrasion and be as color-fast and washable as dyes used on other fabrics.

29. Manufacturers of awnings, porch furniture, garden and beach umbrellas need an improvement in the sun-resistant quality of dyes. The lighter shades and tints are extremely evanescent.

30. There is a need for colors in all shades, stable against hot air and steam, to be used in rubber manufacturing.

31. Purification of dye waste waters which will be economical to the dyeing and printing industry.

32. The fur industry needs a non-fading gray dye that can be applied at room temperature by brushing or dipping.

33. A white ink for printing on dark colored corrugated board with rubber plates.

34. A writing fluid that will not freeze.

35. If an ink could be developed which would lie on the surface of newsprint without striking through, it would enable us to produce a cleaner printed newspaper.

36. Odor-free inks would be particularly useful for labels for food and confectionery.

37. We are now marketing carpet for theatres and locations where low visible light is needed, which, when seen under the invisible rays of ultraviolet, fluoresces and permits good visibility for walking to seats, etc. We badly need a dyestuff for wool which fluoresces blue.

Ceramics

38. Method of extracting iron from refractory clays in Pennsylvania and Ohio, so as to make pure white burning clays available for use in refractories.

39. One of the greatest needs among the users of ceramic clay products is a clay body having extremely low porosity but high elasticity.

40. A Portland cement completely resistant to acid mine water.

41. A satisfactory bond for the forming of Cold Bonded Super Refractory Ware, giving the ware sufficient strength to withstand handling without prefiring.

42. Revivification and reclamation of fine synthetic clays used for filtering Pennsylvania lubricating oils.

43. Refractory product to be used in the manufacture of fire-brick which will stand oxidizing and reducing conditions to 3000 degrees C.

44. Porcelain that does not shrink in firing, thus permitting more accurate shapes.

45. Continuous filter and dryer suitable for highly plastic clay bodies.

46. Silica brick is not able to stand high temperatures for more than from three to four months, resulting in an open-hearth furnace being down for repairs for almost a week. Some brick must be developed to keep pace with the steel industry.

47. A cheap, super-refractory with minimum expansion and spalling coupled with a high heat conductivity; also a similar refractory that is a good heat insulator.

48. The adaptation of cement molds now used for the production of non-ferrous alloy castings to ordinary steel castings so that the high quality material in the skin of the castings which now must be ground off to keep within the permissible tolerances, could be retained in the finished product.

49. A lactic acid-proof, good wearing, hard, non-slip floor topping to be used in the dairy industry.

50. Non-shrinking mortar.

51.* More uniform grades of foundry molding sand, probably synthetic.

52.* A satisfactory filling material for expansion joints in concrete highways and the joints in brick and block pavements is badly needed.

53. An inexpensive, flexible, acid and alkali-resistant material for joining sewer pipe.

54. American clays to be used in the manufacture of our ware instead of importing English and French materials.

Communication

55. Contrivance which would convert sound vibrations of a voice directly into printed form.

56. Television on the 'phone where you can see the other party's face, and no earpiece required so both hands would be left free to work with data while conversing.

57. A small portable, lightweight device which would permit people to easily and quickly communicate and receive messages. Portable, self-contained equipment of this type would revolutionize our social economics far more than telephone has in the past.

58. A means of incorporation of the "delayed speech" mechanism in a radio equipped with recording devices so that the program could first be listened to, giving the operator an opportunity to decide on its merit before cutting the record.

59. Talking books and newspapers to save eyestrain.

Fuel

60. A unit for absorbing solar energy so that the power thus obtained could be used to operate mechanical devices.

61. A new means of transportation for powdered fuel from the mines to market centers to materially lessen transportation cost. The du Pont people have recently taken out patents on methods of carrying fine coal in suspension through pipe lines.

62. A method of distilling a cheap fuel from farm crops or farm waste to enable the farmer to operate his machinery with greater economy.

63.* A device to take the waste heat energy from exhaust gases and utilize it for jet propulsion at very high speeds thereby adding to the performance of aircraft by the utilization of power now wasted.

64. The direct utilization of energy in coal by means of chemical conversion to electrical energy, by-passing the mechanical cycle, offers great possibilities. The most advanced central station now operates with an overall efficiency of 40% wherein the mechanical cycle is included. On the other hand, with hydro stations, overall efficiencies of 90% are not uncommon.

65. Practical methods of converting coal to gas at mine mouth.

66. In the West, we have immense deposits of bituminous coal of a low grade, but not sub-bituminous or lignitic in nature. We need a coking process to produce a satisfactory blast furnace coke low enough in cost to take advantage of the increase in the western iron and steel business. Such a process would revolutionize industry on the Pacific Coast.

67. The gas industry faces a serious problem in the elimination of organic sulphur from city gas distributed to its customers.

68. A cheap protective coating to prevent coal from rusting in storage piles.

Glass

69. A type of glass for automobiles that will deflect or absorb glare.

70.* A transparent, colorless, isotropic, homogeneous medium, having the same refractive index for all wave lengths. This would be a glass which could refract without dispersion. Such a material would permit very great improvement in optical instruments and would make possible other undreamed-of researches.

71. A glass that would soften electric light into true daylight.

72.* Improved glass suitable for 1500 pound boiler water level gage glasses.

73. Ordinary single-glazed windows permit more than four times as much heat to escape per unit of area as do uninsulated frame walls. Double-glazed windows reduce this excessive loss to about one-half. What is needed is a translucent, or best of all, a transparent substance of exceedingly low heat conductance, which may be placed between layers of glass to furnish insulation comparable to opaque walls. Since this can probably only be accomplished by the creation of a myriad of air pockets which would interfere with vision, it may be that the newly discovered process for rendering the surfaces of transparent materials

non-reflective and therefore invisible, would figure in such a development.

74. A process to render glass non-reflecting, enabling treatment of large areas. This would be especially valuable if it could be applied to glass already installed, such as in show windows and art galleries.

75. A flexible glass which would not break and which, if fractured, would not leave a cutting edge.

Insecticides and Fungicides

76. The greatest boon to the horticulturist would be insect control by a death ray of a controllable fumigant, not harmful to humans or animals. It might be a chemical food which would be taken up by the tree and serve as a repellent to insects. These are now controlled mainly by continuous spraying with insecticides, but there is nothing for the control of boring insects. A short cold wave, deadly to insects but harmless to trees and flowers, might be the answer.

77. The citrus industry needs something to control the increasingly menacing red scale. Oil sprays have unfavorable effects on the tree and fruit, while cyanide gas is very expensive and dangerous to the operators. An effective control material would have a market of hundreds of thousands of dollars in Southern California alone.

78. Eel worm is spreading over the cultivated land of the country, as well as in the greenhouse. Chloropicrin and other substances are able to eradicate it from the soil, but the cost is so prohibitive that operations have been confined to very valuable plots. A low priced chloropicrin substitute is badly needed.

79. A permanent moth- or termite-proofing agent.

80. In the field of house fumigants, there is need for some substance which will be toxic to infestations, but not toxic to human

beings. Hydrocyanic acid and methyl bromide have toxic properties which make them dangerous, while chloropicrin possesses an intolerable smell.

Leather

81. In the field of heavy leathers, the greatest need is faster tannage. The average tanner now tans his leather in about three months which compels even the smaller tanners who put through about four hundred hides a day to carry a very large inventory.

82. In the art of tanning, we have progressed farthest in this country, but when it comes to the matching of colors or the dyeing of materials, we are far behind Great Britain. Our colors are fast, but we cannot get two successive dye lots to come out exactly the same in color or even one lot of skins to run uniform in color.

83. A chemical or process that would eliminate iron (salt rust) from solutions of tanning materials. Iron not only darkens the color of these materials, but is a factor in deterioration by oxidation.

84. A material to add to vegetable tan liquors to prevent discoloration of the skins on exposure to light would command a large potential market.

85. Improve upon the washability of leather gloves.

86. A material to combat greasy spew which affects batches of certain types of leather.

87. A satisfactory process for tannage of white leather.

88. Development of materials or processes designed to increase the weight, or heft, of leather.

Marine

89. A device for allowing officers to inform themselves of the position, speed and direction of approaching ships.

90. A practical cargo ship propelled by hookups of small internal combustion motors of automobile type.

91. A means of preventing the formation of barnacles.

92. On the west coast of the United States millions of dollars of damage are done yearly by the insect known as the marine borer, which destroys wooden piles when they are placed below the surface of the water. A method is needed for killing off the pest.

93. Improved fog signal.

94. A new type of design for small water-craft, incorporating discoveries about skin friction, water resistance, etc., that have been made in building fast, maneuverable boats for wartime uses. New materials such as magnesium and aluminum alloys are available and indications are that present V-bottom designs are on the way out and will be replaced by something better.

95. A submarine designed especially for carrying cargoes which would overcome the disadvantages of the Deutschland which reached this country during World War I.

96. It is still impossible to salvage from deep water and the man who can invent a device to do this will make himself a millionaire many times over. It is to be borne in mind that the treasures of the deep sea belong to anyone who can bring them to the surface.

97. Method of preventing condenser tubes from corroding.

98. An improved high efficiency propeller that will not break as easily as those now in use.

99. Means of ridding ships of rodents which cause thousands of dollars' worth of damage yearly.

100. A submarine capable of exploring the depths of the ocean. It will have to be built to withstand tremendous pressures.

101. Means of changing propeller blade while ships are at sea.

102. A means of removing barnacles without the necessity of drydocking.

103. Improved form of marine paint that will last longer when exposed to the weather and that might in a small measure prevent the formation of barnacles.

104. The gyroscopic compass has come into general use on large vessels but it has still to be employed on the smaller ships that cannot afford the expensive installation. A simplified gyro-compass for small ship use would be a valuable improvement.

105. Improved non-sinkable lifeboat.

106. Large gyroscopes are now employed in a few cases to prevent ships from rolling heavily at sea. Gyroscopes for this purpose are very costly and if some simple substitute or device could be found it would come into general use.

107. A simple reversible propeller that can be used on small boats.

108. An automatic ferry landing.

109. A sail boat that cannot capsize.

110. A method of attaching propellers so that they cannot come off. Many sea tragedies have been precipitated by the loss of a propeller.

111. A method of propelling smaller boats without the use of propellers.

112. Every year several hundred outboard motors are lost from boats due to capsizing. A better method of attaching motors would prevent this.

Medicine

113. A means of immunizing people against the common cold, or respiratory infection. This results in one of the greatest wastes in industry today.

114. More than 90% of the people in the United States are afflicted with diseases of the teeth, regardless of age, sex, or economic circumstances. Within the province of the bio-chemist, the cause and method of treatment may be discovered.

115. Apply chemical technology to medicine. Insulin and sulfanilamide are only the start of a procession which should change medical technique. Take arthritis and allied diseases. We need a chemical method of dissolving abnormal calcium without affecting the normal calcium. This, also, may well apply to cancer by preventing abnormal growth of cells without upsetting normal growth.

116. Synthesis of hormones in the pure crystalline form, will offer medical science tremendous opportunity. Interrelationship of the various endocrine glands makes endocrine disorders of a widely divergent scope. Purified preparations for the treatment of these disorders would be of great value.

117. Development of chemo-therapeutic agents for staphylococcus and other organisms which do not yield to sulfanilamide.

118. A few years ago, there were only a handful of people interested in vitamins and yet their work laid the foundation for the vitamin field of today. Now, enzymes are known to few and their application is just being realized. An enzyme that will hydrolyze cellulose will make a great contribution to medicine and industry.

119. Serum to inoculate against measles.

120. An effective, non-habit-forming substitute for morphine or opium alkaloids.

121. Research on the separation of various constituents from the blood stream only at specific points in the body to form specific materials. For instance, a nitrogen material separates at the ends of the fingers and is converted into the keratin of the nails which are found only at the extremes of the body.

122. Topical anesthetics which could penetrate the unbroken skin either by massage or by absorption through a solution similar to the method of anesthetizing teeth through the dentin by the Hartman solution.

Packaging

123. Process to avoid impairment of flavor, now taking place through pasteurization and chemical preservatives, would perform a monumental service for food processors.

124. A cigarette package, completely moisture-proof without need of cellophane wrapping, strong enough to resist crushing of cigarettes and costing no more than present packings, would be a winner.

125. Container for quick frozen foods that will absolutely prevent dehydration.

126. In the delivery of ice cream in the form of bricks or fancy molds, dry ice is often used as a refrigerant, but when placed in close contact with the ice cream, it becomes too hard unless the consumer removes the dry ice an hour before the ice cream is to be eaten. A package is needed to either insulate the dry ice from the product or to slow up or control the intensity of the refrigerant.

127. In the packing of table syrups, we need something to eliminate the corrosion at the upper surface of the can which forms streaks in the syrup.

128. Improved protection of candy from dirt and infestation in stores.

129. Quality hard candy becomes sticky and unpleasant to handle in humid weather. Something to prevent this would have a big market. This is a different problem from the breakdown of chocolate coatings in hot weather.

130. A non-refillable can for oil, cheaper than present tin cans.

131. Barrels should be built so they could be readily opened, collapsed and stacked, producing salvage rather than axe fodder.

Paper

132. A cheap substitute for casein in production of high-quality coated papers for fine color printing.

133. A chemical, non-volatile at steaming temperature, and soluble in water, to add to ground wood pulp which will prevent its changing color during steaming.

134. A fibre sheet, from which food containers can be made, impervious to gas, water vapor, and water.

135. An inexpensive method of coloring paper on the paper machine.

136. Cardboard for packaging food products that is entirely odorless.

137. A drying process which would dry fibre-board sheets in a really square shape, eliminating the wasteful bulges along the edge of the sheet.

138. A practical process of de-inking printed papers to make the pulp available for remanufacture into white paper.

139. Increase the whiteness and permanency of groundwood papers with particular regard to fading in the presence of light.

140. A paper or chipboard so impregnated that an unbreakable container could be made for paint, beer or oil.

141. Better disposable dishes. A product, attractive and practical for daily meals, would have a ready market.

142. If newsprint manufacturers could produce a sheet free of the roughness caused by the screen in the Fourdrinier paper-making machine, a better printed newspaper would be possible.

143. A material to be added in the paper mill beaters during the manufacture of paper to make the finished sheet moisture-proof,

grease-proof, and oil-proof, but not change its color or flexibility, would cut the cost over the laminated product and provide packers with a much desired inexpensive container.

144. Paper and board sizing that will surpass rosin in water resistance.

145. A process which would convert waste sulphite liquor into a profitable by-product. One plant is making a vanilla substitute of high quality therefrom, but the market is, of course, limited.

Petroleum

146. A process for making marketable liquid fuels from the methane in field gases.

147. Methods for securing more complete recovery of oil from oil sands.

148. A fuel for the internal combustion engine that will burn without detonation under the increasing compression ratios.

149. There is a real need for an extreme pressure lubricant that will not leave corrosion stains on the steel and bronze parts of the machine.

150. With the rapid development of Diesel engines, a lower ignition temperature of the fuel is becoming necessary. There are indications that the addition of a small amount of catalytic material may accomplish this. This will cheapen the construction cost of Diesel motors and considerably extend their usefulness.

151. A method of evaluating the detonating characteristics of gasoline so as to predict the engine performance.

152. A fuel for passenger automobiles, having the cost of fuel oil and about the same BTU.

153. Temperature-resistant greases to enable the effective use of those higher permissible operating temperatures, now possible, in products using glass for electrical insulation.

154. Petroleum refiners need a method which will enable them to adjust the ratio of various products made from a given crude to satisfy the demands of the seasons.

155. An effective extreme pressure addition agent for use in cutting oils for copper alloys.

156. A material which, when applied to wool in the picking, will lubricate it without injury to machinery parts. It must not interfere with dyeing nor reduce the wear life of the wool.

157. Oil that would have constant low viscosity from -10 degrees F. to $+125$ degrees F.

158.* A lubricating oil having small change in viscosity over a wide range of temperature for service requiring free running lubrication through a range of temperatures -45 degrees F. to $+150$ degrees F.

159. An economical process for desulphurization of petroleum and gasoline without detrimental effect on its detonating quality.

160. A cheap process for the production of synthetic fats or fatty acids from petroleum base materials.

Photography

161. An ultra high speed photographic emulsion coated on clear film base and having characteristics of almost complete color blindness. The emulsion should be sensitive to the blue end of the spectrum and be characterized by a degree of transparency, comparable with that obtainable in the modern litho type emulsion.

162. Focusing screen for professional cameras on which the image will appear in monochrome or natural color as desired, and right side up instead of inverted.

163. Adjustable camera lens board to obviate the necessity of cutting an additional lens board for each lens and for each camera.

164. An inexpensive, dependable means of color reproduction in 16 mm motion picture films. Technicolor promises to have a "one shot" camera ready which will replace the present expensive "three color" camera. Then Technicolor production, now limited to two studios, can be carried on in studios throughout the country.

165. Elimination of the cellulose nitrate film base and the introduction of an equivalent safety base, together with a means of forming the foil.

166.* A photographic enlarging paper with the latitude of modern film negatives. A paper to faithfully reproduce the tone now present in the negative.

167. A commercial photographic film that will not shrink with age nor change in dimensions with changes in atmospheric humidity.

168.* A method of producing prints in full color direct from original color transparencies in one operation.

169. The development of film and photographic plates with sufficiently resolving power to reproduce the fine details of type with fidelity.

170. Inexpensive direct viewer for direct color transparencies with a light powered by a dry cell so that such viewers may be as portable as miniatures.

Printing

171. A machine to set type by photoelectric technique so that "copy" for offset printing may be prepared without the casting and make-up of actual metal type.

172. A process to eliminate the present heavy expense for three-color half-tone plates and make possible the printing of color reproductions in short runs.

173. A new type of base for half-tones to reduce expensive make-ready in letter press printing.

174. In glass tableware, we need a decalcomania for simulating hand painting that can be run in layers at about 1050 degrees F.

Railroad Equipment

175. The development of a main line Diesel freight locomotive capable of selling at the same price as present steam locomotives, would save railroad companies more than \$1,000,000 per day in operating expense.

176. A method of burning powdered soft coal in steam locomotives, now used by stationary steam plants giving them the most satisfactory source of heat in the history of steam generation. It would open the way to the cheapest fuel the railroads have ever had, with the additional facility of automatic pressure regulation.

177. The Pullman Company should eliminate the sleep-disturbing menace of the water hammer in the Pullman heating system.

Rubber

178. Development of a domestic supply of natural rubber or a suitable substitute at prices competing with natural rubber.

179. Development of suitable rubber materials and compounding technique which will permit the economic use of rubber in highway construction other than fillers between the sections of concrete roadways.

180. Development of a form of rubber which would not lose so much of its traction on wet surfaces. Possibly some of the rubber substitutes could be formulated with some such property in mind.

181. A modified rubber or substitute material similar to crumb or powdered rubber which could be prepared and sheeted or

molded without the high cost involved in present heavy machinery and processes preparatory to fabrication.

182. The development of a sheet rubber flooring which would be competitive with linoleums, taking into account the increased service which rubber offers.

183. Tires for the road-building-equipment manufacturer which embody only such features as static load carrying ability, oil and sun resistance, 2000 mile life, and speeds up to 20 miles per hour with traction speeds up to 40 feet per minute. We now must over-tire our equipment with tires having features we have no use for.

184. A rubber-like material which would retain its properties at temperatures of 500 degrees F.

185. A process to reclaim synthetic rubber such as Neoprene, Thiokol, etc.

186. One of the greatest developments in the progress of the rubber manufacturing industry was the application of carbon black obtained by allowing the flame of burning natural gas to impinge against a cold metal surface. We would like a white powdered material with approximately the same degree of fineness and the same reinforcing effect on rubber. This would be a distinct contribution to the advancement of the rubber industry.

187. In the manufacture of molded and extruded rubber products, many fillers are used including limestone, clay, mineral earth, and wood flour. We need a good gravity reinforcing pigment, preferably light in color, that will deliver 1 1/4 cents per pound. The tonnage is large, our consumption alone in 1939 having been over 12,000,000 pounds.

188. An economical process of removing sulphur from vulcanized rubber which would leave the scrap as it was before vulcanization.

189. Material to be added to a rubber mix to reduce the diffusion of air through the rubber.

Tobacco

190. The processing of tobaccos after leaving the farmer is a long and expensive procedure, requiring two years or more of aging and much machinery for handling. If a means could be found to shorten this period, it would be the most important thing that could come to our industry.

191. Develop new products from tobacco stems. Huge quantities of stems are removed during the manufacturing of tobacco and cigarettes, most of which is simply waste because of the limited market for nicotine and various fertilizers now produced from them.

192. A tobacco that leaves no ash.

Wood

193. Chemical treatment that will speed the drying of wood and render it impervious to moisture, make it highly fire resistant, and protect it from organisms of decay and the ravages of insects. This development can be forecast from experiments conducted with certain sugars which greatly accelerate the rate of drying and deposit enough chemical residue to raise the combustion point.

194. Process for making furniture more immune to atmospheric and climatic changes. Wood furniture and other wood products now swell and shrink, causing minute checking of paint, varnish and lacquer coatings on their surface.

195. The photoengraving field needs a wood block that will not warp or change its dimensions because of weather or humidity conditions.

196. The lumbermen of the Pacific Northwest need some way of utilizing the waste from the log after manufacturing lumber. Only 40% goes into wood.

197. We use three and a half million feet of hard maple to make 20,000,000 pairs of wood heels annually and need an inexpensive workable substitute for hard woods. Since it takes from 50 to 150 years to grow hard maple, there is not much hope that the wood will be grown as fast as consumed.

198. Process for seasoning timbers 6x6, 8x8, 10x10.

199. A wood treatment to reduce warping of cedar or basswood Venetian blind slats.

200. A method of piling the better grades of hardwood to prevent crosser stain.

201. Manufacturers of whisky cooperage now use only quarter-sawed white oak. They now air dry the staves and heading for a period of four to six months prior to kiln drying. A means of kiln drying white oak green from the saw, without destroying the properties of the wood, would be of immense value to the industry.